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Woodbridge, VA 22192-5755
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March 5, 2020

Dr. Susan Carlson
Director, Division of Biotechnology and GRAS Notice Review (HFS-255)
Office of Food Additive Safety
Center for Food Safety and Applied Nutrition
Food and Drug Administration
5001 Campus Drive
College Park, MD 20740

Dear Dr. Carlson:

SUBJECT: Transmittal of the **AlzChem Trostberg GmbH**
GRAS Notice for **Creatine Monohydrate**
For use as source of **Creatine**

Enclosed you will find the General Recognition of Safety Notice for **Creatine Monohydrate** as source of creatine in FDA regulated food as submitted by AlzChem Trostberg GmbH.

I have provided a CD of the GRAS notice and all the cited references.

Should you have any questions on this filing, please contact me, at your convenience.

Sincerely,

[redacted]

Kristi O. Smedley, Ph.D.
Consultant to AlzChem Trostberg GmbH

Attachments:

AlzChem Trostberg GmbH GRN NARRATIVE of Notice (Hard copy and CD-Copy)
Appendices (within narrative file) (Hard Copy and CD-copy)
Full Complement of References (CD-copy)

cc: Barbara Niess, AlzChem

CREATINE MONOHYDRATE
GRAS NOTIFICATION

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1. INTRODUCTION AND CLAIM REGARDING GRAS STATUS

Creatine is a substance naturally occurring in the body of all vertebrates playing a central role in energy metabolism. It is an endogenous substance, with the highest natural concentrations in the skeletal muscle and in the heart muscle of humans. It occurs naturally in foods such as meat, fish and other animal products. It is also formed endogenously by the liver, kidney and pancreas from the amino acids glycine, arginine and methionine. The Notifier's product creatine monohydrate (trade name Creapure®) is produced by chemical synthesis. From a concentrated aqueous solution creatine (regardless of its natural or synthetic origin) crystallizes in the form of creatine monohydrate (CM) which is currently the most common form used in dietary supplements. It is also the form intended as a food ingredient for addition to food.

This GRAS notification is filed under the provisions of the Food and Drug Administration's regulations (Title 21 of the Code of Federal Regulations 170 Subpart E-Generally Recognized as Safe (GRAS) Notice).

A. NAME AND ADDRESS OF NOTIFIER

AlzChem Trostberg GmbH
Attention: Dr. Barbara Nieß
Dr.-Albert-Frank-Str. 32
D-83308 Trostberg
Germany

B. NOTIFIER'S US REPRESENTATIVE

Kristi O. Smedley, Ph.D.
Center for Regulatory Services, Inc.
5200 Wolf Run Shoals Rd.
Woodbridge, VA 22192
USA

C. COMMON OR USUAL NAME OF GRAS SUBSTANCE

Common name: Creatine monohydrate (CAS 6020-87-7)

Synonyms: Glycine, N-(aminoiminomethyl)-N-methyl-, hydrate (1:1); Glycine, N-(aminoiminomethyl)-N-methyl-, monohydrate (9CI); Creapure; N-amidinosarcosine hydrate

D. INTENDED USE

Creatine monohydrate, trade name Creapure®, is intended for use as a food ingredient in foods such as energy drinks, protein bars, milk shakes, protein powders, meal replacement powders and bars, meat analogues and dry mix drinks. It is proposed that creatine monohydrate will be added to foods in specific categories to provide an intake of 1 g of creatine (1.12 g creatine monohydrate) from a single portion. Foods will be presented in single portion packs or recommended portions sizes will be provided on packaging. The use of creatine monohydrate in food does not cover the application in infant formula and foods commonly consumed by young children.

E. STATUTORY BASIS FOR THE CONCLUSION OF GRAS STATUS

The determination of GRAS status is based on scientific procedures, in accordance with 21 C.F.R. § 170.30(b).

We submit information in the following areas:

- Identity and specification for creatine monohydrate;
- The production of Creapure® creatine monohydrate;
- Intended uses and an estimation of consumption of creatine monohydrate;
- Relevant safety data on creatine monohydrate;
- Reviewers' evaluation and conclusion that creatine monohydrate is GRAS for its intended uses.

F. EXEMPTION FROM PREMARKET APPROVAL

Creatine monohydrate, trade name Creapure®, has been determined to be generally recognized as safe under the conditions of intended use as proposed herein, and is therefore exempt from the requirement of premarket approval requirements of the Federal Food, Drug and Cosmetic Act. The basis of this finding is presented in this dossier.

G. AVAILABILITY OF INFORMATION

In accordance with 21 CFR 170.225(c)(7) a complete copy of the data and information that form the basis for this GRAS determination in electronic format will be provided to the Food and Drug Administration together with this submission. The data and information is also available for FDA review and copying during customary business hours at the offices of Kristi O. Smedley, Ph.D., Center for Regulatory Services, Inc., 5200 Wolf Run Shoals Rd., Woodbridge, VA 22192.

H. DISCLOSURE OF INFORMATION

Parts 2 to 7 of this dossier do not contain data or information that is exempt from disclosure under the Freedom of Information Act.

I. STATEMENT AND SIGNATURE

To the best of our knowledge, our GRAS notice is a balanced submission that includes unfavorable information as well as favorable information, known to us and pertinent to the evaluation of the safety and GRAS status of the use of the substance.

AlzChem Trostberg GmbH

[redacted]

Dr. Benedikt Hammer
VP Regulatory Affairs

[redacted]

Dr. Barbara Nieß
Regulatory Affairs Manager

February, 26. 2020

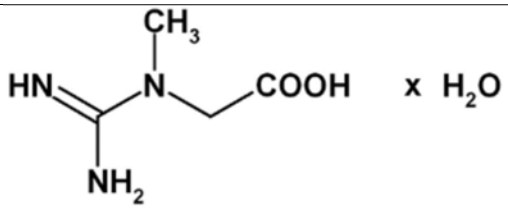
Date

2. PRODUCT IDENTITY AND SPECIFICATION

A. IDENTITY

Creapure® creatine monohydrate is a compound that is produced through chemical synthesis from the raw materials cyanamide and sodium sarcosinate. The molecular structure of creatine monohydrate is identical to the compound as found naturally in vertebrates.

Table 1: Properties of creatine monohydrate (CAS: 6020-87-7)

Appearance	
Form	Powder
Color	Colorless
Odor	Odorless
Physical state	Solid
Information on physical and chemical properties	
Molecular weight	149.1 g/mol
Molecular formula	$C_4H_9N_3O_2 \cdot H_2O$
Chemical structure	
pH	7.4 (14 g/L; 68 °F / 20 °C)
Melting point	ca. 554 °F (290 °C)
Water solubility	14 g/L (68 °F / 20 °C); 6 g/L (39.2 °F / 4 °C)
Ignition Temperature	> 1472 °F (> 800 °C)

B. PRODUCT SPECIFICATION

Creapure® creatine monohydrate is specified as given in Table 2. Representative Certificates of Analysis of three consecutive batches are given in **Annex 1** of this submission. The quality control of Creapure® creatine monohydrate is performed applying validated analytical methods.

Table 2: Product specification of Creapure®

Parameter	**Specification**	**Method**
Assay Creatine monohydrate[1]	≥ 99.9 %	HPLC
Creatinine	≤ 100 mg/kg	HPLC
Dicyandiamide	≤ 50 mg/kg	HPLC
Dihydrotriazine	≤ 3 mg/kg (=LOD)[2]	HPLC

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1% water of crystallization; [2] LOD: Limit of detection

Regular control is performed for heavy metals and microbiology (***Table 3***). Representative Certificates of Analysis are given in **Annex 1** of this submission. Analysis of heavy metals is performed using validated analytical methods, whereas microbiology parameters are assessed in accordance with methods described in the European Pharmacopoeia.

Table 3: Periodic controls for Creapure®

Parameter	**Specification**	**Method**
Heavy metals		
Lead	≤ 0.1 mg/kg	ICP-OES
Arsenic	≤ 0.1 mg/kg	ICP-OES
Cadmium	≤ 0.1 mg/kg	ICP-OES
Mercury	≤ 0.10 mg/kg	ICP-OES
Microbiology[2]		
Molds and Yeasts	≤50 cfu/g	Ph. Eur. 2.6.12
Total aerobic plate counts	≤1000 cfu/g	Ph. Eur. 2.6.12
Coliform bacteria	neg/g	Ph. Eur. 2.6.13
E. coli	neg/g	Ph. Eur. 2.6.13

Parameter	Specification	Method
Salmonella sp.	neg/25g	Ph. Eur. 2.6.13
Staphylococcus aureus	neg/g	Ph. Eur. 2.6.13

[2] Ph. Eur. Methods are harmonized with USP methods.

C. ALLERGENS

Creatine monohydrate as such is not classified as an allergen, and when manufactured applying proper hygienic principles, and hazard analysis and critical control point (HACCP) measures does not contain or come in contact with food allergens.

Hence, Creapure® as manufactured by the Notifier does not contain or come into contact with allergens or intolerance causing substances as listed in Annex II of EU Regulation (EU) No 1169/2011 on the provision of food information to consumers and as listed in the Food Allergen Labeling and Consumer Protection Act of 2004 (Edition 4).

D. LABELING, STORAGE AND STABILITY INFORMATION

i. Pure substance

Table 4: Labeling declaration, storage conditions and shelf-life for Creapure® creatine monohydrate

Labeling declaration	Creatine Monohydrate
Storage conditions	Keep tightly closed. Creapure® should be stored dry at cool to room temperature.
Shelf-life	The shelf life of Creapure® is min. 36 months from the date of manufacture, in the original unopened container, under the suggested storage conditions.

The storage stability of Creapure® creatine monohydrate was tested with three different lots of Creapure®. Samples were stored in the original packaging material for 0, 3, 6, 9 and 12 months at 40 °C / 75 % r.h. and for 0, 3, 6, 9, 12, 18, 24, 36, 48 and 60 months at 25 °C / 60 % r.h. The product was analyzed for its appearance, the assay of creatine monohydrate, creatinine content, sum of other impurities and water content. The stability program for Creapure® creatine monohydrate revealed that the product is stable for 60 months at 25 °C / 60 % r.h. (***Table 5***) and for 12 months at 40 °C / 75 % r.h. (

Table 6); only a slight increase in the total water content of about 1-2 % was observed after 60 months of storage. The assay for creatine monohydrate and the creatinine content remained almost constant and in accordance with specified limits. No changes for microbiology parameters were observed after the respective storage periods (

Table 7 and ***Table 8***).

Table 5: Stability test with three lots of Creapure® at 25 °C / 60 % r.h.

	Date of analysis	Appearance	Assay [%]	Creatinine[1] [mg/kg]	Sum of other impurities (HPLC) [%]	Water [%]
Target		**White, crystalline powder**	**≥ 99.9**	**≤ 100**	**for info only**	**for info only**
Lot ES 98404259						
Start	06.05.2008	complies	101.2	n.d. (< 67)	n.d. (< 0.05)	11.5
3 months	05.08.2008	complies	101.2	n.d. (< 67)	n.d. (< 0.05)	11.3
6 months	12.11.2008	complies	101.9	n.d. (< 67)	n.d. (< 0.05)	11.4
9 months	06.02.2009	complies	100.1	n.d. (< 67)	n.d. (< 0.05)	11.7
12 months	15.05.2009	complies	100.0	n.d. (< 67)	n.d. (< 0.05)	11.7
18 months	11.11.2009	complies	101.7	56	n.d. (< 0.05)	11.8
24 months	01.07.2010	complies	101.5	47	n.d. (< 0.05)	11.9
36 months	19.05.2011	complies	101.4	47	n.d. (< 0.05)	12.8
48 months	14.05.2012	complies	102.2	47	n.d. (< 0.05)	13.3
60 months	22.05.2013	complies	102.4	33	n.d. (< 0.05)	13.4
Lot 808731						
Start	06.05.2008	complies	100.8	n.d. (< 67)	n.d. (< 0.05)	11.0
3 months	05.08.2008	complies	102.4	n.d. (< 67)	n.d. (< 0.05)	11.0
6 months	12.11.2008	complies	102.0	n.d. (< 67)	n.d. (< 0.05)	11.1
9 months	06.02.2009	complies	101.3	n.d. (< 67)	n.d. (< 0.05)	11.3
12 months	15.05.2009	complies	101.4	n.d. (< 67)	n.d. (< 0.05)	11.5

	Date of analysis	Appearance	Assay [%]	Creatinine[1] [mg/kg]	Sum of other impurities (HPLC) [%]	Water [%]
18 months	11.11.2009	complies	100.7	56	n.d. (< 0.05)	11.7
24 months	01.07.2010	complies	101.5	41	n.d. (< 0.05)	12.2
36 months	19.05.2011	complies	100.9	43	n.d. (< 0.05)	12.4
48 months	14.05.2012	complies	101.0	42	n.d. (< 0.05)	12.3
60 months	22.05.2013	complies	101.3	29	n.d. (< 0.05)	12.5
Lot 811131						
Start	06.05.2008	complies	100.5	n.d. (< 67)	n.d. (< 0.05)	11.2
3 months	05.08.2008	complies	101.9	n.d. (< 67)	n.d. (< 0.05)	11.3
6 months	12.11.2008	complies	101.9	n.d. (< 67)	n.d. (< 0.05)	11.5
9 months	06.02.2009	complies	100.9	n.d. (< 67)	n.d. (< 0.05)	11.3
12 months	15.05.2009	complies	100.1	n.d. (< 67)	n.d. (< 0.05)	11.5
18 months	11.11.2009	complies	101.5	48	n.d. (< 0.05)	11.5
24 months	01.07.2010	complies	101.1	41	n.d. (< 0.05)	12.0
36 months	19.05.2011	complies	101.5	44	n.d. (< 0.05)	12.4
48 months	14.05.2012	complies	101.1	39	n.d. (< 0.05)	12.3
60 months	22.05.2013	complies	101.7	28	n.d. (< 0.05)	12.7

[1] During conduct of the stability program the analytical method for creatinine was re-validated resulting in a lower limit of quantification of 16 mg/kg.

Table 6: Stability test with three lots of Creapure® at 40 °C / 75 % r.h.

	Date of analysis	Appearance	Assay [%]	Creatinine [mg/kg]	Sum of other impurities (HPLC) [%]	Water [%]
Target		**White, crystalline powder**	**≥ 99.9**	**≤ 100**	**for info only**	**for info only**
Lot ES 98404259						

	Date of analysis	Appearance	Assay [%]	Creatinine [mg/kg]	Sum of other impurities (HPLC) [%]	Water [%]
Start	06.05.2008	complies	101.2	n.d. (< 67)	n.d. (< 0.05)	11.5
3 months	05.08.2008	complies	101.3	n.d. (< 67)	n.d. (< 0.05)	11.3
6 months	12.11.2008	complies	101.5	n.d. (< 67)	n.d. (< 0.05)	11.5
9 months	06.02.2009	complies	101.5	n.d. (< 67)	n.d. (< 0.05)	11.7
12 months	15.05.2009	complies	100.2	n.d. (< 67)	n.d. (< 0.05)	11.7
Lot 808731						
Start	06.05.2008	complies	100.8	n.d. (< 67)	n.d. (< 0.05)	11.0
3 months	05.08.2008	complies	101.8	87	n.d. (< 0.05)	11.1
6 months	12.11.2008	complies	101.1	n.d. (< 67)	n.d. (< 0.05)	11.5
9 months	06.02.2009	complies	100.1	n.d. (< 67)	n.d. (< 0.05)	11.6
12 months	15.05.2009	complies	99.9	95	n.d. (< 0.05)	11.6
Lot 811131						
Start	06.05.2008	complies	100.5	n.d. (< 67)	n.d. (< 0.05)	11.2
3 months	05.08.2008	complies	101.6	n.d. (< 67)	n.d. (< 0.05)	11.5
6 months	12.11.2008	complies	101.6	n.d. (< 67)	n.d. (< 0.05)	11.9
9 months	06.02.2009	complies	101.1	n.d. (< 67)	n.d. (< 0.05)	12.0
12 months	15.05.2009	complies	100.1	n.d. (< 67)	n.d. (< 0.05)	11.8

Table 7: Stability tests for Creapure® at 25 °C / 60 % - results of microbiology testing

	Date of analysis	Molds and yeasts [cfu g^{-1}]	Total aerobic plate count [cfu g^{-1}]	Coliform bacteria [neg g^{-1}]	Salmonella sp. [neg / 25 g]	Staphylo-coccus au. [neg g^{-1}]
Target		**≤ 50**	**≤ 1000**	**neg g^{-1}**	**neg / 25 g**	**neg g^{-1}**
Lot ES 98404259						

	Date of analysis	Molds and yeasts [cfu g^{-1}]	Total aerobic plate count [cfu g^{-1}]	Coliform bacteria [neg g^{-1}]	Salmonella sp. [neg / 25 g]	Staphylo-coccus au. [neg g^{-1}]
Start	06.05.2008	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
60 months	22.05.2013	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
Lot 808731						
Start	06.05.2008	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
60 months	22.05.2013	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
Lot 811131						
Start	06.05.2008	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
60 months	22.05.2013	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}

Table 8: Stability testing of Creapure® at 40 °C / 75 r. h. – results of microbiology testing

	Date of analysis	Molds and yeasts [cfu g^{-1}]	Total aerobic plate count [cfu g^{-1}]	Coliform bacteria [neg g^{-1}]	Salmonella sp. [neg / 25 g]	Staphylo-coccus au. [neg g^{-1}]
Target		**≤ 50**	**≤ 1000**	**neg g^{-1}**	**neg / 25 g**	**neg g^{-1}**
Lot ES 98404259						
Start	06.05.2008	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
12 months	14.05.2009	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
Lot 808731						
Start	06.05.2008	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
12 months	14.05.2009	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
Lot 811131						
Start	06.05.2008	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}
12 months	14.05.2009	< 10	< 10	neg g^{-1}	neg / 25 g	neg g^{-1}

In addition, five retained samples of Creapure® that had been stored for around six years under practical conditions in the Notifier's warehouse at an average kinetic temperature of 18 °C were analyzed for their appearance, creatine monohydrate assay, creatinine content,

sum of other impurities and water content (***Table 9***). All parameters were still within specified limits corroborating the stability of the substance.

Table 9: Analysis of six retained samples of Creapure® stored for approx. 6 years

	Date of analysis: 11.09.14	Appearance	Assay [%]	Creatinine [mg/kg]	Sum of other impurities (HPLC) [%]	Water [%]
Target		**White, crystalline powder**	**≥ 99.9**	**≤ 100**	**for info only**	**for info only**
Lot	Manufacturing Date					
803331	02.02.08	complies	101.2	22	n.d. (< 0.05)	13.0
809431	03.04.08	complies	101.6	23	n.d. (< 0.05)	12.8
817831	26.06.08	complies	100.8	24	n.d. (< 0.05)	12.7
822031	08.08.08	complies	101.1	26	n.d. (< 0.05)	12.8
832131	15.11.08	complies	101.1	24	n.d. (< 0.05)	12.7

ii. Stability in food

The powder form of creatine monohydrate has been shown to be stable for a minimum of three years at room temperature. Similar stability can be expected when creatine monohydrate is included in dry powders such as protein powders, meal replacement powders and drink mix powders.

In aqueous solution, intramolecular cyclization and degradation to creatinine can occur depending on the pH and temperature. At neutral pH (7.5 to 6.5) creatine is reasonably stable. Storage of a creatine in a pH 5.5 solution for 3 days resulted in 4% loss, at pH 4.5 12% was lost, and at pH 3.5 21% was lost (Jäger et al., 2011). Lowering the pH to below 2.5 makes it more difficult for intramolecular cyclization to occur and degradation to creatinine is minimal.

Milk shakes have a pH of around 6.5 to 7.0 and are generally stored in the refrigerator; therefore creatine can be expected to be sufficiently stable for the shelf-life of such products. Drink mix powders are often consumed promptly after preparation of the liquid beverage, and should be stored at low temperature to slow degradation if prolonged storage

is necessary. Creatine monohydrate may degrade rapidly in shelf-stable types of standard acidic beverages including energy drinks (pH ca. 2.5 to 4).

Creatine monohydrate in solid state and in solution is also prone to degradation during prolonged exposure to elevated temperatures, and water activity is another factor influencing creatine stability (Uzzan et al., 2007; Uzzan et al., 2009). This should be considered when selecting appropriate methods for food product design and preparation.

Successful incorporation of creatine monohydrate in bars has been achieved (Deldicque et al., 2008).

E. MANUFACTURING PROCESS

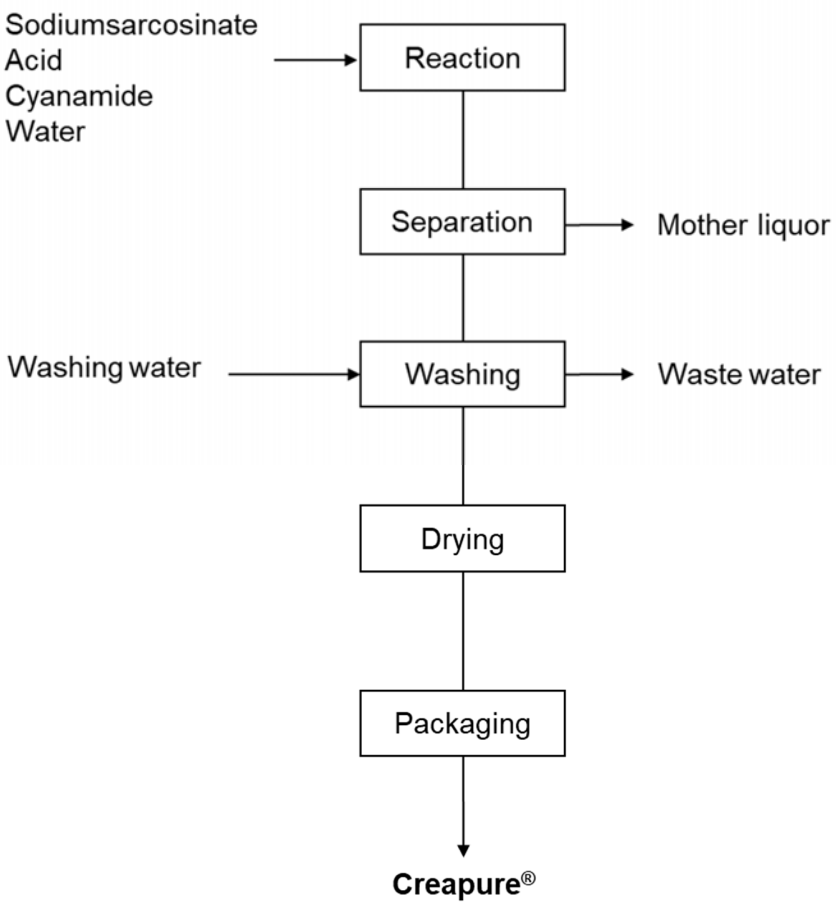


Figure 1: Flow Chart for the manufacturing of Creapure® creatine monohydrate

Creapure® is produced by a well-established and controlled process protocol by the Notifier. For production of Creapure® HACCP and Preventive Controls principles are applied. All premises and equipment fulfill food/cGMP requirements.

The flow chart is depicted above in **Figure 1**.

An aqueous solution of sodium sarcosinate is poured into a stainless steel reactor. The pH is adjusted by addition of acid, and the mixture is heated up to > 70 °C. An aqueous solution of cyanamide is added at this temperature. Creatine monohydrate precipitates from the reaction solution. After cooling down creatine monohydrate is separated by a suction filter. The wet filter cake is washed several times with potable water. The mother liquor and the washing water are discarded. The wet filter cake is dried in a dryer under vacuum after which the product is packaged. The packaging material is in compliance with relevant regulations on food contact materials in the EU and the USA.

By-products of the reaction are creatinine that forms from intramolecular cyclization of creatine, and dicyandiamide (DCD) which is generated through dimerization of cyanamide. The occurrence of the by-product dihydro-1,3,5-triazine (DHT) is dependent on the raw material source and synthesis route of sodium sarcosinate: The presence of trace amounts of an organic impurity in the raw material solution is a prerequisite for DHT formation during creatine synthesis. The Notifier uses a raw material source for sodium sarcosinate where this organic impurity is absent, and thus the formation of DHT cannot occur during the manufacturing process. However, the Notifier includes a specification for dihydrotriazine as a quality measurement.

All raw materials used in the process are either sourced from qualified suppliers or are manufactured in-house. They are characterized by raw material specifications to ensure constant quality. Besides assay specification, also relevant requirements on possible impurities e.g. heavy metals or organic impurities are included. Compliance of the guaranteed raw material quality with applicable specifications is periodically controlled by means of controls of the incoming raw materials. Only potable water is used during manufacturing.

Release control of the product is performed for every lot of Creapure®. The product is tested against the specification as outlined in **Section 2.B.** Validated analytical methods are used for quality control of raw materials and the final product Creapure® creatine monohydrate.

3. CONDITIONS OF INTENDED USE IN FOOD AND DIETARY EXPOSURE

A. FOODS IN WHICH THE SUBSTANCE IS TO BE USED

Creatine monohydrate may be used in a variety of foods. As a food ingredient for functional or nutritional purposes it is intended to be added to products like energy drinks, protein bars, milk shakes, protein powders, meal replacement powders and bars, meat analogues and dry mix drinks. It is proposed that creatine monohydrate will be added to foods in specific categories to provide an intake of 1 g creatine from a single portion.

B. CREATINE MONOHYDRATE INTENDED USE

Creatine monohydrate plays a central role in energy metabolism. It is an endogenous substance, with highest natural concentrations in skeletal muscle and heart muscle of humans. Based on studies investigating the role of creatine monohydrate in energy metabolism, the potential benefits of supplementing creatine monohydrate include:

- Improvement of physical performance, increase in muscular strength and improved recovery after exercise (Branch, 2003; Buford et al., 2007; Kreider et al., 2017; Nissen and Sharp, 2003);
- Effects on working memory and concentration (Dolan et al., 2019; Rae and Bröer, 2015);
- Maintenance of bone health (maintenance of bone mass) (Chilibeck et al., 2015; Gualano et al., 2016)

C. DIETARY INTAKE ASSESSMENT

i. Introduction

An estimation of creatine intake through consumption of specific food categories to which creatine has been added has been performed. The detailed report is given in **Annex 2**. Creatine is a natural compound in food and consumed as part of an omnivorous and varied diet, thus background intake has to be considered for an overall estimation of creatine intake.

It is proposed that creatine will be added to foods in specific categories (***Table 10***) to provide an intake of 1 g from a single portion. In natural matrices creatine is present as such and the intake assessment has been performed for creatine, whereas for food fortification synthetic creatine monohydrate would be used. **Hence, it is important to note**

that 1 g creatine corresponds to 1.12 g creatine monohydrate. Foods in which creatine monohydrate is used will be presented in single portion packs or recommended portions sizes will be provided on packaging. The use of creatine monohydrate in food does not cover the application in infant formula, and foods commonly consumed by young children.

Creatine will only be added to foods for which a standard of identity does not exist.

Table 10: List of food categories

Food category	**Notes**
Energy drinks	RTD (powders, tablets) including sports drinks
Protein bars	Including breakfast bars
Milk Shakes	Excluding slimming / meal replacement products
Protein powders	Including soy-based
Meal replacement	Powders and bars
Meat analogues	Egg and meat substitutes
Dry mix drinks	Excluding meal replacements and instant coffee

ii. Daily Consumption Calculation – Modeling Consumer Exposure to Creatine

Average natural occurrence levels were combined with NHANES food consumption data to estimate each individual's average daily intake of natural creatine from each food group and from all groups combined. The population average, 90th and 95th percentiles for all individuals in each age category were then estimated.

For each food falling into the categories for new uses listed in ***Table 10*** it was assumed that consumption on each and every eating occasion reported in the survey would result in an intake of 1 g creatine. The actual quantities consumed were not used in the calculation. Each individual's average total daily intake of added creatine from each food group and from all groups combined was then calculated. The population average, 90th and 95th percentiles for all individuals in each age category were then estimated.

The approach applied follows FDA Guidance for Industry: Estimating Dietary Intake of Substances in Food and in particular the case study on the carotenoid canthaxanthin, which appears in Appendix B of the Guidance (FDA, 2006). For food categories where there are less than 100 consumers, estimates of upper percentiles may be unreliable.

iii. Results

Total intakes of natural creatine from animal products ranged from about 0.2 g/day at the average for 1 to 2 year old children to 1.2 g/day at the 95th percentile for adults. High fish consumers appeared to have the highest intakes followed by consumers of other meat products. Dairy products did not appear to make a significant contribution.

Intakes of creatine after addition of 1 g per portion to selected food categories ranged from about 0.5 g/day for average consumers up to about 2 g/day for high level consumers. Intakes of less than 1 g/day indicate that consumers consumed less than one portion of the foods listed in ***Table 10*** on a daily basis. When natural occurrence was combined with added usage at 1 g per portion in selected food categories, high level intakes ranged up to 1.8 g/day (***Table 11***). This is lower than the high level intakes from addition of creatine alone because the inclusion of large numbers of consumers with relatively low intakes from natural sources tends to lower the values of upper percentiles.

Table 11: Intakes of creatine from natural sources plus the addition of 1 g (corresponds to 1.12 g creatine monohydrate) per portion to selected foods.

	Age group					
	All	1 to 2	3 to 9	10 to 17	18 to 64	65+
N	8082	506	1139	1302	1302	1067
% consuming	79%	54%	72%	85%	27%	82%
Mean	0.6	0.4	0.5	0.6	0.6	0.5
P90	1.4	1.0	1.2	1.3	1.3	1.2
P95	1.8	1.3	1.5	1.7	1.7	1.5

iv. Conclusion

Natural intakes of creatine for American consumers average around 0.4 g/day and can be as high as 1.4 g/day for high consumers of fish (see **Annex 2**). The addition of 1 g creatine (1.12 g creatine monohydrate) per portion of selected foods gives average intakes of around 1 g per day rising to over 2 g/day for high level consumers of certain foods. When natural creatine and added creatine are combined, average intakes are about 0.6 g/day with high level intakes rising to around 1.8 g/day. This is because the numbers of consumers of product selected for addition of creatine are relatively low in comparison to consumers of animal products.

If consumers were aware of the addition of creatine to selected foods and altered their consumption of those foods accordingly, then total intakes of creatine would be expected to alter to reflect this change.

4. SELF-LIMITING LEVELS OF USE

None.

5. EXPERIENCE BASED ON COMMON USE IN FOOD BEFORE 1958

Creatine is a natural nutrient in meat and fish, and hence there is a long history of natural exposure to creatine through the consumption of food. Creatine monohydrate was originally isolated and characterized from meat broth (Liebig, 1847), and during the late 19th and early 20th century meat extracts, naturally containing creatine, were used as a substitute for fresh meat[1].

However, the Notifier is not aware that before 1958 synthetic creatine monohydrate was commonly used as added nutrient in food.

[1] See: https://en.wikipedia.org/wiki/Liebig%27s_Extract_of_Meat_Company

6. CREATINE MONOHYDRATE SAFETY NARRATIVE

A. SOURCES AND FUNCTION OF CREATINE

Creatine is an endogenous substance found in its free and phosphorylated form mainly (>95%) in skeletal muscle but also in the heart muscle, brain and testes of vertebrates (Balsom et al., 1994; Wyss and Kaddurah-Daouk, 2000). It is synthesized endogenously in the pancreas, kidneys and liver from the amino acids glycine, arginine and methionine at a rate of 1 to 2 g/day (Balsom et al., 1994). Due to its natural occurrence in meat, fish and other animal products creatine is a common substance in the food supply. Literature typically reports creatine intake levels from a mixed diet to lie between 1 to 2 g of creatine per day (Balsom et al., 1994), although those levels might slightly overestimate actual intake levels. According to the intake assessment in **section 3.C** and **Annex 2** based on the NHANES database, natural creatine intake ranges from 0.4 g/d to 1.2 g/d at the 95th percentile for adults.

Creatine and creatine phosphate are important compounds contributing to energy metabolism processes: The enzyme creatine kinase catalyzes the reversible transfer of phosphate between creatine phosphate and ADP ensuring the supply of ATP, the most important energy-carrying molecule in the cell, and thereby providing a high intracellular flux of high-energy phosphates. This is of particular importance for organs and tissues that have high and fluctuating energy demands such as skeletal muscle, brain, heart, retina and spermatozoa (Wyss and Kaddurah-Daouk, 2000).

Dietary creatine, independent of whether it is consumed from natural sources or through dietary supplementation, serves the same role as endogenous creatine, and muscle content of total creatine reflects dietary habits. In humans, creatine kinase-containing cells and tissues can have around 120 mmol/kg dry mass creatine (~3.9 g/kg wet mass[2]) increasing to 140 to 155 mmol/kg dry mass (~4.6 to 5.1 g/kg wet mass) following a dietary creatine supplementation program (Balsom et al., 1994; Harris et al., 1992; Wyss and Kaddurah-Daouk, 2000). On the other hand, vegetarians and vegans have generally lower levels of total creatine of around 100 to 110 mmol/kg dry mass (~3.2 to 3.6 g/kg wet mass) (Burke et al., 2003), and the change of dietary habits from an omnivorous to a vegetarian diet leads to a decrease in the body's own creatine pool (Blancquaert et al., 2018). Accordingly, serum creatine levels are generally lower in vegetarians (mean values: males 25.1 µmol/L; females 32.4 µmol/L) than in non-vegetarians (mean values: males 40.4 µmol/L; females 50.2 µmol/L) (Delanghe et al., 1989).

[2] Calculated based on the following estimation: muscle mass consists of ¾ of water; 120 mmol/kg dry mass corresponds to 30 mmol/kg wet mass, and that is ~3.9 g/kg wet mass creatine.

Assuming an average body weight of 71 kg for women and 87 kg for men with an average relative skeletal muscle mass of 31 % and 38 % for women and men, respectively (Janssen *et al.*, 2000), and a skeletal muscle creatine content of between 3.2 and 5.1 g/kg wet mass, the body's own creatine pool amounts to an overall quantity of between 70 g and 169 g (***Table 12***).

Table 12: The body's own creatine pool

	Women	**Men**
Body weight [kg]	71	87
Skeletal muscle mass [%]	31	38
Body creatine [g]	70 – 112	106 – 169

B. METABOLIC FATE OF CREATINE

Orally ingested creatine (from food sources or as creatine monohydrate) is absorbed from the gastrointestinal tract via active transport similar to other nutrients such as amino acids, glucose or vitamins and is transported in the blood (Orsenigo et al., 2005; Peral et al., 2002; Peral et al., 2005; Speer et al., 2004; Tosco et al., 2004). Creatine intake leads to a rapid and substantial increase in plasma creatine concentration, reaching a maximum within 1 to 2 hours (Deldicque et al., 2008; Harris et al., 1992; Persky, Brazeau, Hochhaus, 2003; Persky, Müller et al., 2003; Schedel et al., 1999; Schedel et al., 2000). The oral bioavailability of creatine monohydrate is considered to be the same as that of creatine (EFSA Panel on food additives, flavourings, processing aids and materials in contact with food (AFC), 2004), which is considered to be high (>90%), in particular for low doses as evidenced by the lack of creatine in feces after intake of a 2 g dose of creatine (Deldicque et al., 2008; Sale et al., 2009). Degradation of creatine to creatinine during digestion is of negligible magnitude as has been shown in an *in vitro* digestion study (Hageböck et al., 2014).

The source of ingested creatine influences uptake kinetics, e.g. the peak in plasma creatine level after consumption of meat is somewhat attenuated compared to the same creatine dose provided in the form of a solution (Harris et al., 2002). Also, when provided in the form of protein- or beta-glucan- rich food bars, absorption of creatine was shown to be slowed down 4-fold and 8-fold, respectively, compared to an aqueous creatine solution (Deldicque et al., 2008). Concomitant intake of creatine together with high amounts of sugar or sugar plus protein prolongs absorption time and augments creatine retention in the body (Pittas et al., 2010; Steenge et al., 2000).

Clearance of creatine from the blood occurs via uptake into tissue, such as skeletal muscle, but also into brain, eyes, cardiac muscle, testes and kidneys, and via renal clearance

(Persky, Brazeau, Hochhaus, 2003; Schedel et al., 1999). Creatine uptake into muscle and other tissue is mediated by a sodium- and chloride-dependent creatine transporter (Sora et al., 1994) . In healthy individuals the kidneys function to salvage creatine from the urine and excretion of creatine via urine is low (reference value range: 15 to 270 mg/day)[3]. Notable quantities of creatine are only excreted under muscle-mass reducing conditions, during fasting or high dietary intake of creatine, or in patients with certain diseases (Silber, 1999). The ability of tissues to store creatine is limited and no overload is possible. Accordingly, during dietary supplementation of creatine the capacity of the muscles to extract creatine from the blood may be exceeded. This occurs particularly during prolonged intake of high doses (20 g/day) during which a large portion of the ingested creatine may be excreted unchanged via the urine (Terjung et al., 2000).

A constant fraction of the body's creatine and creatine phosphate is irreversibly degraded to creatinine in a spontaneous, non-enzymatic process, and is excreted via the urine (Wyss and Kaddurah-Daouk, 2000). Creatinine excretion is typically between 0.95 and 2.94 g/day in men and between 0.60 and 1.70 g/day in women, which corresponds to 1.10 to 3.4 g/day of creatine for men and 0.69 to 1.97 g/day for women.[4] This constant loss of creatinine has to be balanced by creatine intake from the diet and endogenous creatine synthesis.

C. STUDIES ON THE SAFETY OF CREATINE MONOHYDRATE

i. Intended Use

Creatine monohydrate, trade name Creapure®, is intended for use as a food ingredient in foods such as energy drinks, protein bars, milk shakes, protein powders, meal replacement powders and bars, meat analogues and dry mix drinks. It is proposed that creatine monohydrate will be added to foods in specific categories to provide an intake of 1 g of creatine (1.12 g creatine monohydrate) from a single portion. Foods will be presented in single portion packs or recommended portions sizes will be provided on packaging. The use of creatine monohydrate in food does not cover the application in infant formula and foods commonly consumed by children.

[3] Reference values retrieved from: https://www.mlhb.de/analysen/komfort-suche/details/?tx_mlhbassays_pi5[filter][sword]=kreatin&tx_mlhbassays_pi5[filter][cat]=assay&tx_mlhbassays_pi5[controller]=Assay&tx_mlhbassays_pi5[assay]=1626&tx_mlhbassays_pi5[action]=show&cHash=16db86d6c2ee0c0e66489f5afefc7fc6

[4] Reference values retrieved from: https://www.mayomedicallaboratories.com/test-catalog/Clinical+and+Interpretive/8513

ii. Availability of safety studies in humans

The consumption of supplementary creatine monohydrate by humans has been well-investigated and there are hundreds of original publications and numerous review articles in the publicly available scientific literature. Initially, creatine monohydrate studies in humans were performed to investigate the effects of creatine monohydrate on exercise performance of athletes; but during the past few years studies have focused increasingly on non athletes and recently a growing number of studies have specifically targeted creatine use by the elderly. A literature search, performed to identify original literature published since the 1990's which include information related to the safety of creatine monohydrate intake by humans, recovered studies in healthy adults ranging from 18 to 70 years of age (***Table 14***). Much of the publicly available literature on the safety of creatine monohydrate for human consumption published before 2016 has been evaluated as part of risk assessments of human intake of creatine monohydrate undertaken by various regulatory bodies and authorities (See Section 6.I).

Many of the creatine monohydrate human safety studies listed in ***Table 14*** included a loading phase of 15-25 g/day for 4-7 days followed by a maintenance phase of 2-5 g/day. Total periods of ingestion of creatine monohydrate varied from 1 week to 5 years and the main investigated possible adverse effects were related to renal function, liver function and gastrointestinal problems which are discussed in the following sections.

iii. Effect of creatine monohydrate on kidney function

Since the 1990's when creatine monohydrate became a popular dietary supplement, there have been a handful of case reports of individuals purportedly taking creatine (with or without other supplements) who presented with high serum creatinine levels and/or renal dysfunction. In addition to the human case studies, a murine study suggested that feeding creatine to rats with cystic kidney disease exacerbated progression of the disease. The case reports and rat study prompted researchers to examine in depth the impact of creatine supplementation on renal function in controlled intervention studies. The rat studies and human case studies that raised concerns about the effect of creatine supplementation on kidney function are described in detail below together with summaries of intervention studies performed to investigate the renal concerns.

1. *Animal studies investigating creatine monohydrate intake and kidney function*

Edmunds *et al.* performed the rat study that initially suggested a possible link between creatine supplementation and kidney dysfunction (Edmunds et al., 2001). The researchers found that 4-week-old male and female Han:SPRD-cy rats (mean final body weight 344g in males and 241g in females, initial body weight not given) with renal cystic disease fed

a creatine glutamate mixture (5:1 w/w) at 2.0 g creatine/kg feed for 7 days followed by 0.48 g creatine/kg feed for 35 days (human equivalent of 21 g/day followed by 3 g/day for a 70-kg man) had exacerbated disease progression (increased relative kidney weight, increased serum urea, lower creatinine clearances). Taes *et al.* followed on from this work by investigating the effects of prolonged ingestion of a higher dose of creatine, 0.9 g/kg bw/day as creatine monohydrate (human equivalent of 63 g/day for 4 weeks for a 70-kg man), on renal function of male Wistar rats with normal kidney function or sham-operated and partially nephrectomized (effectively inducing renal failure) (Taes et al., 2003). Inulin and creatinine clearance rates, serum cystatin C concentration, urinary protein excretion, and albumin and urea clearance were comparable between control and creatine-supplemented animals in the normal and nephrectomized animals, leading the researchers to conclude that creatine monohydrate intake did not impair kidney function. The authors noted that the creatine glutamate formulation used by Edmunds et al., 2001 was an over-the-counter formulation that could contain traces of contaminants or toxic products and the purity was not established. Taes *et al.*, also noted that the end point Jaffé-based method used by Edmunds et al., 2001 to measure creatinine, is susceptible to interference from non-specific chromogens, and therefore the creatinine values reported by Edmunds *et al.*, 2001 may have been influenced by creatine concentrations. Taes *et al.*, 2003 also maintained that while the Han:SPRD-cy is a well-established animal model of human polycystic kidney disease, it cannot be used as an animal model for general renal functional impairment.

Several years later, Ferreira *et al.* fed 10-week-old male Wistar rats 2 g/kg feed of creatine monohydrate for 10 weeks (calculated to be equivalent to ~12.6 g/day creatine for a 70-kg man, based on a default factor of 0.09 for rats in subchronic studies (EFSA Scientific Committee, 2012) and subjected half the animals to treadmill exercise (Ferreira et al., 2005). In sedentary animals creatine supplementation was associated with decreased glomerular filtration rate and renal plasma flow, whereas the opposite was seen in exercised animals, i.e. creatine supplementation was associated with increased glomerular filtration rate and renal plasma flow. Urinary protein excretion and urine flow rate were not different between treatments and there were no differences between treatments in haematocrit, indicating that the rats remained euvolemic and anatomopathological light microscopy of the kidneys showed no morphological alterations. The study has some weaknesses e.g., the amount of consumed creatine was expressed per mass consumed food, and whether the animals actually ate all the food was not controlled; also renal values were measured in anesthetized animals after open surgery, thus probably not mimicking renal physiology in awake, free living mammals. In a recent study to further investigate any possible effects of creatine supplementation on kidney function in sedentary male Wistar rats, Baracho *et al.* found that up to 2 g/kg bw/day creatine (as creatine monohydrate) (equivalent to 140 g/day for a 70-kg man) for 14 days did not result in renal or hepatic toxicity as evidenced by

measurements of glucose, creatinine, total cholesterol, triglycerides, aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, total protein, albumin, urea, and creatinine clearance (Baracho et al., 2015).

Souza *et al.* administered supraphysiological doses of creatine to male Wistar rats (5 g/kg bw/day for 1 week, thereafter 1 g/kg bw/day for up to 8 weeks; equivalent to 350 g/day and 70 g/day for a 70-kg adult) (Souza et al., 2009; Souza et al., 2013). Serum levels of albumin and total protein were not affected by dietary creatine supplementation, but urea and creatinine were increased and histological analysis indicated some kidney damage. Human intake of creatine, including the use of creatine monohydrate in the selected foods, was estimated in section 3.C of this notification to be around 2 g/day in high level consumers. The human equivalents of the creatine doses given to the rats in this study are 175 and 35 times higher than the highest estimated daily human creatine intake. An increase in serum concentration of creatinine is not surprising at such high intakes and creatine could provide an additional source of arginine which would result in higher serum urea levels. Unfortunately, more specific glomerular filtration rate indicators such as plasma cystatin C and urinalysis parameters were not measured in the study. While the authors reported that there were some structural alterations indicating renal damage in rats administered supraphysiological doses of creatine, they failed to mention how many kidneys were examined for each treatment, how many kidneys exhibited abnormalities, and no data was provided to permit an independent conclusion. It could therefore not be objectively determined whether the kidney incidences were isolated or test article-related.

In summary, the results of the animal study by Edmunds *et al.*, 2001 reporting adverse effects of creatine supplementation on kidneys of rats with already impaired renal function are questionable due to concerns raised about method interference, test article purity, and appropriateness of the animal model. Also, the reduced glomerular filtration rate and renal plasma flow in creatine-supplemented sedentary healthy rats in the study by Ferreira *et al.*, 2005 were not accompanied by additional indicators of kidney dysfunction and were not supported by the results of Baracho *et al.*, 2015 showing no negative effects on kidney function in sedentary rats given a higher dose of creatine monohydrate and subjected to a thorough battery of analyses to measure effects on kidney and liver. It can therefore be concluded that the publicly available animal studies investigating the effects of creatine on kidney function do not provide evidence that creatine monohydrate supplementation at doses similar to those consumed by humans has an adverse effect on kidney function in healthy rats and those with already impaired kidney function.

2. Human case studies investigating creatine intake and kidney function

Publicly available literature was searched for case studies in which creatine intake may have been linked to kidney function. The studies are summarized in ***Table 13*** and described below in detail. The studies frequently reported serum creatinine levels and creatinine clearance values as the basis for concern related to kidney function. Serum creatinine levels normally range from 50 to 110 µmol/L (0.5-1.2 mg/dL) in adults and creatinine clearances range from 100 to 150 mL/min; individual values vary with sex, age, body weight and muscle mass (Cockcroft and Gault, 1976). In all cases the level of creatine that is reported to be consumed far surpasses the intended use described in section 3 (exposure) of this notice.

Table 13: Case reports linking creatine use to renal dysfunction

Case report No.	Subject	Self-reported supplement protocol	Self-reported use of drugs or other supplements	Pre-existing renal disease?	Author
1	19-year-old male American football player	10 g/d for 3 months	Albuterol and nedocromil inhalers, Zafirlukast tablets	No	(Kuehl et al., May 1998)
2	25-year-old male recreational soccer player	5 g/d for 1 week + 2 g/d for 7 weeks	Cyclosporine	Nephritic syndrome	(Pritchard and Kalra, 1998)
3	20-year-old healthy male	5 g/d for 4 weeks	Not reported	No	(Koshy et al., 1999)
4	18-year-old patient	5 g/d for 28 months	Not reported	Nephropathy	(Barisic et al., 2002)
5	22-year-old male bodybuilder	200 g/d (chronic use)	Metandione	No	(Révai et al., 2003)
6	24-year-old male recreational bodybuilder	15 g/week for 6 months	18 plant extracts, vitamins, minerals, amino acids, nonherbal supplements	No	(Thorsteinsdottir et al., 2006)
7	18-year-old healthy male	20 g/d for 5 days + 1 g/d for 6 weeks	No reported use of nephrotoxic drugs or herbs	No	(Taner et al., 2011)
8	32-year-old healthy male	20 g/d for 3 days + 1 g/d for 3 weeks	No reported use of nephrotoxic substances	No	(Ardalan et al., 2012)
9	Four male bodybuilders, 20 to 26-years-old	15g/d	Anabolic steroids, protein supplement, vitamins	No	(Almukhtar et al., 2015)
10	26-year-old male bodybuilder	Reported only as triple prescribed dose	Anabolic steroids	Family history of lupus	(Ahmed and Yasser Aldabbagh, 2019)

Case report 1: An American football player who had been taking 10 g/day creatine monohydrate for 3 months, presented with complaints of fatigue and dyspnea during practice (Kuehl et al., May 1998). Serum creatinine levels were 1.7 mg/dL (150 µmol/L) with creatinine clearances of 138 mL/min. After discontinuation of creatine supplementation and treatment with aerosolized steroids, serum creatinine levels decreased over 1 month to 1.3 mg/dL (115 µmol/L) and fatigue and dyspnea resolved. While serum creatinine of 1.7 mg/dL (150 µmol/L) is above the normal range for adults, levels in American football players not taking any supplements were as high as 1.80 mg/dL (160 µmol/L) in one study (Mayhew et al., 2002) and 1.7 mg/dL (150 µmol/L) in another (Kreider et al., 2003). Serum creatinine levels of the young man were similar to those of other American football players and his creatinine clearance was high, therefore, kidney dysfunction was not evident in this case study.

Case report 2: A 25-year-old man who had been taking creatine supplements, presented with serum creatinine levels up to 180 µmol/L and low creatinine clearances of 54 mL/min (Pritchard and Kalra, 1998). One month after cessation of creatine use, plasma creatinine levels reduced to 128 µmol/L with a creatinine clearance of 115 mL/min. The man had an existing underlying renal disease treated for the previous 5 years with cyclosporine, an immunosuppressive drug known for its nephrotoxicity, this case study can therefore not be seen as representative for healthy individuals consuming creatine. Additionally, information on the product taken (amount, impurities) was missing from the report and intake of other supplements and/or drugs was not reported.

Case report 3: A healthy 20-year-old man who had been taking 20 g/day of creatine monohydrate for 4 weeks presented with serum creatinine levels of 124 µmol/L, rising to 203 µmol/L (Koshy et al., 1999) during hospitalization and after having stopped creatine supplementation. Renal biopsy revealed acute focal interstitial nephritis and acute tubular injury. After cessation of creatine use and supportive care, laboratory values returned to normal. Persky *et al.* noted that, most cases of interstitial nephritis are hypersensitivity reactions to medications such as non-steroidal anti-inflammatory drugs or antibiotics (Persky and Rawson, 2007); in addition, obstruction of the tubules can cause this pathology as well. There was no evidence of inflammation hypersensitivity to creatine or renal obstruction as possible causes of the nephritis in this patient. It is possible that the dysfunction was caused by changes in osmotic gradient as seen with compounds such as mannitol.

Case report 4: An 18-year-old patient with a multisystem mitochondrial disorder characterized by encephalomyopathy with progressive mental deterioration, lactic acidosis and stoke-like episodes, was given creatine (20 g/day for 12 days, then 5 g/day for 28 months) to treat psychomental regression, changing states of somnolence and aggressive

and agitated behavior (Barisic et al., 2002). These symptoms disappeared after 4-weeks of treatment. Deterioration of renal function over the 28 months treatment period was indicated by urea retention and impairment of creatinine clearance. A clear connection between creatine use and deterioration of kidney function could not be established as the patient had pre-existing nephropathy and other health issues and was likely on numerous medications.

Case report 5*:* Diffuse membranoproliferative glomerulonephritis type I was reported in a 22-year-old man who had been continuously taking methandion in large quantities and 200 g/day creatine (Révai et al., 2003). Concomitant use of steroids as well as the abusive dose of creatine precludes reaching any conclusion from this incidence.

Case report 6: A healthy 24-year-old weightlifter presented with acute renal failure, proteinuria and creatinine levels of 336 µmol/L (Thorsteinsdottir et al., 2006). For 6 months the man had been taking large amounts of dietary supplements including 15 g/week creatine, 18 plant extracts, amino acids, vitamins, minerals and other nonherbal supplements. The patient recovered fully after he stopped all supplement use, and creatinine levels were 221 µmol/L at discharge. Investigation of the specific cause through withholding of specific supplements was not ethically possible due to the severity of the disease, and whether creatine, another supplement, or a combination was the reason behind the disease could not be identified.

Case report 7: An 18-year-old healthy male presented with 2-days history of nausea, vomiting and stomach ache (Taner et al., 2011). He had taken creatine monohydrate at 20 g/day for 5 days followed by 1 g/day for 6 weeks. Serum creatinine was 201.55 mmol/L at presentation, increasing to 403.10 mmol/L during hospitalization and decreasing to 88.4 mmol/L at discharge (units reported were mmol/L, but it is likely that the authors made an error and units should have been µmol/L). The creatine source and any impurities were not investigated as possible reasons for the adverse effects on the kidneys and health condition prior to supplementation could not be evaluated.

Case report 8: In a similar case, a 32-year-old healthy male presented with 2-weeks history of nausea and weakness (Ardalan et al., 2012). He had taken creatine monohydrate at 20 g/day for 3 days followed by 1 g/day for 3 weeks. Serum creatinine was 4.3 mg/dL (380 µmol/L) at admission, increasing to 6.2 mg/dL (548 µmol/L) and interstitial nephritis and renal failure was diagnosed. After corticosteroid treatment, serum creatinine levels decreased to 1.8 mg/dL (160 µmol/L). The creatine source and any impurities were not investigated as possible reasons for the adverse effects on the kidneys.

Case report 9: Four bodybuilders (20 to 26-years-old) reported weakness and lethargy (Almukhtar et al., 2015). All were taking creatine monohydrate, anabolic steroids, protein and vitamin supplements. Serum creatinine levels were 229 to 335 µmol/L, microscopic

urinalyses were unremarkable and urine reagent strip testing was negative for glucose, protein, hemoglobin and nitrates. Kidney biopsy revealed acute tubular necrosis. Discontinuation of all steroid injections and supplements resulted in serum creatinine levels below 123 µmol/L 4 weeks later. The combination of supplements and anabolic steroids, the possibility of dehydration as a factor, and the presence of significant chronicity in the renal biopsies of two of the patients raising the possibility of preexisting unrelated chronic kidney disease, made it impossible to identify a specific cause.

Case report 10: A young bodybuilder taking creatine supplementation at three times the dose recommendation of his coach (dose not reported) was found to have end-stage renal failure (Ahmed and Aldabbagh, 2019). The combination with anabolic steroids and a family history of lupus made identification of a specific cause impossible.

In summary, case reports are limited in their scientific relevance due to their retrospective design, lack of information on the subjects' clinical background, possible misreporting of other drug/supplement use and missing information about product type and quality. In particular, the purity of creatine products on the market has raised concerns, as products from some manufacturers do not comply with appropriate impurity specifications (Moret et al., 2011). The several human case studies reporting possible links between creatine supplementation and high serum creatinine levels, low creatinine clearances and/or renal dysfunction and the rat studies reporting possible effects on kidney function raised some concern that creatine ingestion could impair renal function (Benzi, 2000; Farquhar and Zambraski, 2002; Juhn, 1999; Juhn and Tarnopolsky, 1998). Consequently, to thoroughly investigate any potential link between creatine use and kidney function, controlled intervention studies were required.

3. *Intervention studies investigating creatine monohydrate and kidney function*

Longitudinal studies in humans (***Table 14***) consistently demonstrated that short-, medium- and long-term creatine monohydrate supplementation did not affect kidney function in healthy adult study participants (Gualano et al., 2008; Kreider et al., 2003; Lugaresi et al., 2013; Poortmans et al., 1997; Poortmans et al., 2005; Poortmans and Francaux, 1999; Robinson et al., 2000; Schröder et al., 2005). Poortmans and coworkers reported that ingesting 20 g/day of creatine for 5 days (Poortmans et al., 1997), 21 g/day for 14 days (Poortmans et al., 2005) and up to 10 g/day from 10 months to 5 years (Poortmans and Francaux, 1999) had no effects on creatinine clearance, glomerular filtration rate, tubular resorptions, or glomerular membrane permeability compared to controls. Kreider et al. reported that creatine supplementation (5–10 g/day for 21 months, as creatine

monohydrate) had no significant effects on creatinine levels or creatinine clearance in American football players (Kreider et al., 2003). Gualano *et al.*, reported that sedentary healthy males taking creatine supplements (10 g/day for 3 months) and subjected to 3 times weekly aerobic exercise maintained unchanged serum creatinine levels throughout the trial, whereas cystatin C levels in both the creatine and control group decreased over time, suggesting an increase in glomerular filtration rate in response to exercise (Gualano et al., 2008). Lugaresi et al. reported that glomerular filtration (as measured by the gold-standard method, ^{51}Chromium-ethylenediamine tetraacetic acid (^{51}Cr-EDTA) clearance), creatinine clearance, serum and urinary urea, electrolytes, proteinuria and albuminuria were unchanged by intake of creatine (5 g/day for 12 weeks, as creatine monohydrate) by healthy individuals involved in resistance training and consuming a high-protein diet (Lugaresi et al., 2013).

The population groups studied have been extended from athletes and healthy adults to include individuals at risk of kidney dysfunction, such as elderly people (Neves et al., 2011) and type 2 diabetic patients (Gualano, Salles Painneli et al., 2011). Neves *et al.*, 2011 found no difference in creatinine or urea levels in urine or serum of postmenopausal women taking creatine supplements (5 g/day for 11 weeks, as creatine monohydrate) and glomerular filtration rates were equivalent and Gualano *et al.*, 2011 reported that 12 weeks of creatine monohydrate supplementation had no effects on kidney function in type 2 diabetic patients. Moreover, long-term, high-dose ingestion of creatine (up to 30 g/day for up to 5 years) in various patient populations have not been associated with an increased incidence of renal dysfunction (Bender et al., 2008; Bender and Klopstock, 2016; Domingues et al., 2019; Groeneveld et al., 2005; Sipilä et al., 1981; Vannas-Sulonen et al., 1985).

In addition to studies in healthy individuals and those at risk of kidney dysfunction, creatine monohydrate has been investigated for possible beneficial effects in patients suffering from kidney-related illnesses. Gualano *et al.* reported the case study of a young man with a single kidney and mildly decreased glomerular filtration rate following a 35-day creatine monohydrate supplementation protocol (20 g/day for 5 days then 5 g/day for 30 days) (Gualano, Ferreira et al., 2010). After the trial period, ^{51}Cr-EDTA clearance, proteinuria and electrolyte levels were unchanged. Albuminuria, serum urea level, and estimated creatinine clearance were decreased, whereas serum creatinine level was slightly increased, falsely suggesting kidney function impairment. Creatine monohydrate intake did not impair kidney function in an individual with a single kidney, mildly decreased glomerular filtration rate and ingesting a high-protein diet. In addition, creatine monohydrate supplementation was explored as a means of reducing homocysteine levels in hemodialysis patients (Shelmadine et al., 2012; Taes et al., 2004) . Episodes of muscle cramps were reduced by 60% in hemodialysis patients taking 12 g of creatine monohydrate at each

dialysis session without causing any adverse effects (Chang et al., 2002). Dialysis patients with chronic kidney disease (CKD) are depleted in creatine in parallel with the duration of dialysis resulting in a creatine deficiency (Post et al., 2019). The accompanying accumulation of cellular damage seen in CKD patients leads to deterioration of musculo-skeletal and neurological functioning and poor quality of life. To counteract creatine depletion, Wallimann *et al.* emphasized the importance of intradialytic supplement of CKD patients with creatine (Wallimann et al., 2017). In addition, Post *et al.* hypothesize that endogenous creatine production progressively decreases with the increasing degree of CKD and elevation of nutritional creatine levels might help to prevent the occurance of many symptoms even in non-dialysis dependent CKD stages (Post et al., 2019).

In 2019, de Souza e Silva *et al.* performed a systematic review and meta-analysis of randomized clinical trials to once and for all clear up the question of whether creatine supplementation may induce renal damage (Souza E Silva et al., 2019). The review was performed according to PRISMA Guidelines covering literature up to March 2018. Case studies and trials assessing creatine supplements and kidney effects in individuals without prior renal damage and published in peer-reviewed scientific journals were selected for inclusion. Robust and reliable results for the variables of creatinine, creatinine clearance and urea were available in the literature and were analyzed in the meta-analysis. The meta-analysis revealed that creatine supplementation does not significantly alter serum creatinine levels and does not alter plasma urea values, resulting in the conclusion that creatine supplementation does not induce renal damage in the studied amounts and durations in individuals without prior kidney damage.

De Souza e Silva *et al.*'s meta-analysis of the publicly available literature on creatine supplementation and kidney function conclusively refutes the notion that intake of creatine monohydrate in amounts normally taken as a food supplement causes kidney dysfunction. The notion of adverse renal effects related to creatine intake arose from the use of serum creatinine levels as an easy-to-measure indicator of kidney function. A serum creatinine concentration exceeding a particular threshold value can suggest kidney failure, which must be verified by more direct clinical testing. This diagnostic paradigm, the association of high serum creatinine concentrations with kidney dysfunction, can overlook situations in which creatinine levels are influenced by factors independent of true changes in kidney function (e.g. large muscle mass, recent meat consumption, drug, vitamin, or dietary supplement intake) and generates cases of pseudo renal failure (Refaie et al., 2007; Williamson and New, 2014; Willis et al., 2010).

In summary, considering that creatine is one of the most popular sports dietary supplements on the market, it is remarkable that only a handful of human case studies possibly relating creatine use to renal dysfunction have been reported. Among the few human case studies

about two thirds of the affected individuals reported taking creatine doses well in excess of recommendations and frequently in combination with other (legal or otherwise) performance enhancing substances. The controlled intervention studies that were performed to specifically investigate renal concerns raised by the case studies have provided the Notifier, numerous other researchers and various regulatory bodies with the scientific basis to conclude that there is no compelling evidence that creatine supplementation negatively affects renal function in healthy (young and old) or clinical populations when taken in appropriate doses (Buford et al., 2007; Chilibeck et al., 2015; Jäger et al., 2011; Kreider et al., 2003; Kreider et al., 2017; Kreider and Jung, 2011; Persky and Rawson, 2007; Pline and Smith, 2005; Poortmans and Francaux, 2000; Sales et al., 2019). Controlled intervention studies have not been performed to investigate effects of creatine supplementation in individuals with decreased kidney function. Considering that the intended use of creatine monohydrate in selected foods would result in only a slight increase in dietary intake of creatine even in high level consumers (95th percentile) from 1.2 g/day to 1.8 g/day (Section 3.C), it is unlikely that the additional dietary intake of creatine would have any negative effects.

iv. Effect of creatine monohydrate on liver function

1. Animal studies investigating creatine monohydrate intake and liver function

Rats that have been exposed to supraphysiological doses of creatine (5 g/kg bw/day for 1 week, thereafter 1 g/kg bw/day for 3 to 7 weeks; equivalent to 350 g/day and 70 g/day for a 70-kg adult) had higher plasma levels of alanine aminotransferase, aspartate aminotranferase, g-glutamyltransferase and alkaline phosphatase and demonstrated some structural alterations indicating hepatic damage (Souza et al., 2009; Souza et al., 2013). Interestingly, physical activity in combination with creatine supplementation lowered liver enzyme levels.

Physiological doses of creatine monohydrate supplementation in mice (up to 0.05 g/kg/d; 3.5 g/day for a 70-kg adult) and rats (2% wt/wt in the feed, calculated by the authors to be 8-12 times doses used in longer-term human clinical trials) caused hepatic inflammatory lesions and induced hepatitis in SOD1 G93A transgenic and CD-1 non-transgenic mice but not in rats (Tarnopolsky, M. A. et al., 2003). Species differences are important to consider when performing toxicological studies in murine models and in this case the difference could be explained by the fact that mice are predominantly herbivores and rats are more omnivorous (in the wild). As a result, mice may not be accustomed to the delivery of high exogenous creatine concentrations via the portal vein. In order to take up dietary creatine, carnivores and omnivores, but not herbivores (such as horses, cows and sheep) express high levels of creatine transporter in their small intestines, where alimentary creatine is

taken up and transported into the blood stream (Peral et al., 2002). As omnivores, humans are more similar to rats than mice, but it is well known that animal models and humans respond differentially to creatine supplementation in several aspects (Deminice and Rosa, 2016; Gualano, Artioli et al., 2010). Therefore, a focus on human clinical and case studies rather than animal studies is warranted.

2. Human studies investigating creatine intake and liver function

Publicly available literature was searched for case studies and controlled intervention studies in which creatine intake may have been linked to liver function. The case studies are described below in detail followed by a summary of the intervention studies. The studies frequently reported levels of enzymes related to liver function.

Case report 1: Kreider *et al.* reported moderate increases in selected blood parameters (creatine kinase, lactate dehydrogenase, aspartate aminotransferase and alanine aminotransferase, with no difference in γ-glutamyltransferase) in 28 football players consuming 15.75 g/day of creatine monohydrate for 28 days (Kreider et al., 1998). Elevations were considered minimal and remained within normal limits, however, the creatine dose used in the study did not reflect standard recommendations prompting the same group to conduct a 21-month study applying a more general supplementation regime (15.75 g/day creatine-monohydrate for 5 days, followed by 5–10 g/day thereafter) in 116 football players. None of the serum markers for liver were altered in this more comprehensive study (Kreider et al., 2003).

Case report 2: Whitt and coworkers reported the case of a 27-year-old man presenting with jaundice (Whitt et al., 2008). The patient was a weightlifter and had been taking creatine supplements for the prior 8 to 9 months and whey protein supplement 4 weeks prior to onset of symptoms. Liver findings were consistent with a drug-induced cholestasis. All supplement use was stopped and laboratory values improved. The creatine supplements taken by the patient did not contain creatine monohydrate; rather they contained creatine ethyl ester malate. Additionally, the dosage taken was not reported, thus preventing a critical assessment.

Case report 3: Avelar-Escobar and coworkers reported the case of a 17-year-old male who developed acute mixed liver injury (Avelar-Escobar et al., 2012). The patient had been taking food supplements containing creatine, vitamins, minerals, L-carnitine, whey protein and amino acids for 3 months. After medical treatment and discontinuation of supplement use, clinical and biochemical parameters improved and the patient was discharged 7 days after admission. The creatine used was a blend of creatine monohydrate, creatine anhydrous and creatine peptide and the dosing regimen was not provided, thus preventing a critical assessment.

Case report 4: Timcheh-Hariri and colleagues reported on the diagnosis of toxic hepatitis in 20 male athletes (24- to 32-years-old) who had been taking creatine monohydrate supplements for 1 year (Timcheh-Hariri et al., 2012). The men had been taking two additional supplements, an optimizer of testosterone production (T Bomb II) containing potentially hepatotoxic ingredients and an amino acid-based supplement (Cell-Tech). After cessation of use of all supplements, clinical recovery and improvement of liver function tests were achieved within 30 days. Following publication of this article, in a letter to the editor, Wallimann (Wallimann, 2013) criticized the lack of information in the case report on the daily use of the three supplements, insufficiently defined ingredients, including hormones, and on the other dietary habits of the men. The article was criticized in another letter to the editor from Gualano and Roschel (Gualano and Roschel, 2014) who argued that the conclusion from Timcheh-Hariri and coworkers that creatine supplementation might have been implicated in bodybuilders' hepatitis is not well grounded and lacks proper appreciation of the wide gap between experimental and clinical studies when it comes to creatine supplementation.

In summary, the human case reports describing possible effects of creatine intake on liver function are limited in their scientific relevance by the lack of information on all supplements or drugs taken, dosing regimens, and possible misreporting of other drug/supplement use. Any potential link between creatine monohydrate intake and liver function can be thoroughly investigated in controlled intervention studies. Studies in healthy adults or athletes (Cancela et al., 2008; Manjarrez-Montes de Oca et al., 2013; Robinson et al., 2000; Schröder et al., 2005; Taylor et al., 2011) post-menopausal women (Chilibeck et al., 2015; Lobo et al., 2015; Sales et al., 2019) cardiac patients (Cornelissen et al., 2010), and type 2 diabetic patients (Gualano, Salles Painelli et al., 2011; Gualano, Salles Painneli et al., 2011) after intake of 3 to 7g/day for 6 weeks to more than 12 months with or without a loading phase did not reveal any evidence that creatine monohydrate adversely affects liver activity. Additionally, in a retrospective study, college American football players who reported using only creatine monohydrate for 0.25 to 5.6 years at doses ranging from 5–20 g/day did not differ in any blood markers for liver function from players who used no supplements whatsoever (Mayhew et al., 2002).

While mice appear to be sensitive to creatine intake, likely due to being mainly herbivores and typically ingesting very little creatine, controlled studies in rats and humans at the recommended and physiological doses have not revealed any adverse effects of creatine monohydrate on the liver.

v. Other potential adverse effects of creatine monohydrate

1. Dehydration, weight gain, cramps, gastrointestinal upset

Creatine is known to cause mild water retention and decreased urinary volume due to its osmotic effect – an effect typically observed at loading doses of 20 g/day and not reported in studies performed at physiological dose levels. This may result in temporary weight gain, particularly during the loading phase, which is not necessarily a negative side effect (Devries and Phillips, 2014; Mohebbi et al., 2012; Tang et al., 2014). The increased intracellular water volume could potentially increase the risk of muscle cramps or dehydration (Kim et al., 2015). In addition, gastrointestinal effects, including gas, loose stools or diarrhea could be caused by malabsorption of creatine doses in excess of the intestine's absorption capacity.

Chilibeck *et al.* reported muscle cramps and mild gastrointestinal discomfort in postmenopausal women taking 7 g creatine monohydrate per day for 12 months. Chrusch and coworkers reported a higher incidence as compared to the control group of loose stools during the loading phase (0.3 g/kg bw/day for 5 days) and muscle cramps and muscle strain during the maintenance phase (0.07 g/kg bw/day for 12 weeks)in older men (Chilibeck et al., 2015; Chrusch et al., 2001). The gastrointestinal effects could have been due to the dosing regimen, as Ostojic and Ahmetovic, 2008 found that a single dose of 10 g of creatine monohydrate increased the risk of diarrhea in soccer players, whereas there were no adverse effects on the gastrointestinal tract if taken in two 5 g doses (Ostojic and Ahmetovic, 2008). While occasional muscle cramps were reported in postmenopausal women taking 7 g/day creatine monohydrate, Greenwood and coworkers reported that American football players taking creatine monohydrate (0.3 g/kg bw/day for 5 days, 0.03 g/kg bw/day for 4 months) experienced significantly less incidences of muscle cramping, heat illness/dehydration, muscle strains and total injuries than players not taking creatine (Greenwood, Kreider, Greenwood, Byars, 2003).

Although there are reports in the publicly available literature of isolated cases of dehydration, cramps and gastrointestinal effects, the vast majority of studies presented evidence that intake of creatine monohydrate at the level recommended for supplements did not cause or contribute to dehydration, muscle cramps or gastrointestinal upset (Dalbo et al., 2008; Easton et al., 2007; Greenwood et al., 2000; Greenwood, Kreider, Greenwood, Byars, 2003; Greenwood, Kreider, Melton et al., 2003; Hile et al., 2006; Kreider et al., 2003; Lopez et al., 2009; Rosene et al., 2015; Santos et al., 2004; Volek et al., 2001; Watson et al., 2006).

2. *Down regulation of creatine transporter and endogenous creatine formation*

The creatine transporter is primarily responsible for cellular uptake of creatine against a large concentration gradient. While supplementary creatine intake is not related to down-regulation of the expression of the creatine transporter (Guerrero-Ontiveros and Wallimann, 1998; Tarnopolsky, M. et al., 2003), it is related to a reduction in activity of the enzyme L-arginine:glycine amidinotransferase (AGAT) (Edison et al., 2007; Li, B. et al., 2008; WALKER, 1979; Xiang et al., 2008), and thus to a reduction in endogenous creatine formation. Once creatine stores in muscle are elevated, it may take as long as 4 to 6 weeks following cessation of supplementation before intramuscular phosphocreatine and creatine levels return to baseline, and urinary creatine and creatinine excretion return to pre-supplementation levels (Greenhaff et al., 1993; Hultman et al., 1996; Vandenberghe et al., 1997). No evidence has suggested that muscle creatine levels fall below baseline or that endogenous production remains reduced after cessation of creatine supplementation; therefore, the potential for long-term suppression of endogenous creatine synthesis does not appear to occur (Kim et al., 2011; Kreider et al., 2003). Indeed, results from a study in rats showed that eight days after cessation of creatine supplementation (3 g/kg bw/day for 7 days), concentrations of guanidinoacetic acid and AGAT activity returned to 94% and 100%, respectively, of pre-supplementation levels (Li, X. et al., 2008). Vandenberghe and coworkers demonstrated that urinary creatine and creatinine excretion returned to pre-supplementation levels 4 weeks after discontinuing a 10-week course of creatine supplementation, suggesting that the suppression of endogenous creatine synthesis was reversible (Vandenberghe et al., 1997). Due to concern regarding down-regulation, it was commonly suggested that creatine users should cycle on and off, but continued evidence suggests that this is not necessary (Kim et al., 2011; Kreider et al., 2003) particularly when the multitude of benefits resulting from ongoing low-dose creatine supplementation are considered.

3. *Formation of methylguanidine*

In the body, creatine converts into creatinine in a nonenzymatic process that can be reversible. Creatine and creatinine can also diffuse into the intestinal tract where they are enzymatically degraded via numerous microbial degradation pathways which could potentially result in products such as methylguanidine which may act as uremic toxins, carcinogens or carcinogen precursors (Wyss and Kaddurah-Daouk, 2000). In healthy individuals clearance of creatine and creatinine through enzymatic degradation (ca. 2 ml/min) may be negligible in comparison to glomerular filtration (ca. 120 ml/min), but may become highly relevant under conditions of renal failure. Bacterial degradation in the gut reconverts up to 68% of the metabolized creatinine into creatine which is retaken up into the blood, therefore only a small fraction of the creatinine entering the gut

undergoes further degradation via the numerous microbial pathways (Wyss and Kaddurah-Daouk, 2000).

Taes and coworkers investigated the effects of creatine supplementation on plasma guanidine compounds in renal failure patients on hemodialysis (Taes et al., 2008). In a cross-over trial, patients took 2 g/day creatine or a placebo during two treatment periods of 4 weeks, separated by a washout of 4 weeks. Methylguanidine levels were slightly increased following creatine supplementation (mean of ca. 2.6 µmol/L compared to baseline of ca. 2.2 µmol/L) and levels of some guanidino compounds increased or decreased proposedly due to effects on metabolic pathways.

Creatinine degradation and production of methylguanidine seems to be virtually irrelevant under normal conditions (Yokozawa et al., 1990) when creatinine might even have a beneficial effect by acting as a hydroxyl radical scavenger and have therapeutic effects in neurodegenerative diseases associated with oxidative stress, such as Alzheimer's disease, Parkinson's disease, or amyotrophic lateral sclerosis. At greatly reduced glomerular filtration rate, on the other hand, when the serum concentration of creatinine as well as oxidative stress are considerably increased, the formation of toxic creatinine degradation products may be favored and contribute to further disease progression. To prevent this possibly higher burden, Wallimann *et al.* suggest intradialytic creatine supplementation for dialysis patients, thereby the amount of creatine absorbed from the dialysate would only be the amount required at the time of dialysis, avoiding the need to clear surplus creatine from the system (Wallimann et al., 2017). Oral supplementation with typical creatine supplements on the market was not considered feasible for dialysis patients as it would require relatively large amounts of water to dissolve the creatine powdered which would be problematic for patients needing to restrict water intake.

4. Formation of methylamine and formaldehyde

In a recent review article on the effects of creatine supplementation on the liver, Barcelos and coworkers suggested that creatine accumulation in hepatocytes may contribute to the formation of cytotoxic substances, i.e. methylamine and formaldehyde, due to the lower metabolic capacity of hepatocytes or other tissues to convert creatine into creatinine and the enzymatic capability of accomplishing methylation processes (Barcelos et al., 2016). One should keep in mind that vertebrates convert creatine into creatinine by a non-enzymatic spontaneous reaction, and therefore, reference to the "metabolic capacity" of tissues to convert creatine into creatinine is not accurate. Nevertheless, methylamine could be produced when creatinine is excreted into the gut where it is either reconverted to creatine by bacteria and retaken up into the blood (ca. 68% of the creatinine) or further converted into other degradation products including methylamine (Wyss and Kaddurah-

Daouk, 2000). In healthy individuals creatinine degradation is negligible, whereas renal insufficiency in patients with chronic kidney failure prevents excretion of creatinine via urine and bacterial creatinine degradation becomes more relevant.

Using murine models, it was demonstrated that *in vivo* deamination of methylamine produces formaldehyde and hydrogen peroxide, both of which are recognized as potential cytotoxic substances (Yu and Deng, 2000). Consequently, the authors hypothesized that long-term administration of large quantities of creatine as an ergogenic supplement could increase the production of methylamine and subsequently formaldehyde. While the investigators did find increased formaldehyde in mice urine after creatine administration (single dose of 50 mg/kg), they did not measure markers of protein or DNA cross-linking or indicators of oxidative stress and tissue damage.

Poortmans and colleagues reported that high-dose oral creatine monohydrate supplementation (21 g/day for 14 days) by healthy adults increased excretion of methylamine by 4.5-fold and formaldehyde by 9.2-fold but did not increase formate or urinary albumin in 24-h urine (Poortmans et al., 2005). Plasma creatine was not correlated to urinary methylamine or formaldehyde levels. The results were confirmed by another study looking at urine methylamine after exogenous creatine supplementation although in this case the peak in the plasma creatine concentration was lowered by spreading the dose evenly throughout the day (4 x 5g versus 1 x 20g), thereby markedly lowering total urinary output of methylamine (Sale et al., 2009). The excretion rate of urinary formaldehyde increased by 30.4% in wrestlers taking creatine supplementation (0.3 g/kg/day for 7 days) and undergoing resistance training and 63.4% in wrestlers without training, however no differences were detected in serum enzymes (Nasseri and Jafari, 2016).

The investigations by Poortmans *et al.* 2005 and Sale *et al.* 2009 indicated that short-term oral intake of high doses of creatine by healthy subjects enhanced the mechanisms leading to the conversion of creatine or creatinine to sarcosine and then to methylamine, the latter giving rise to formaldehyde. In turn, the conversion of formaldehyde to formate should be rather rapid in cells (Boeniger, 1987). Compared to basal state (0.40-0.70 mg/day), methylamine levels in the studies reached a mean value of 5.00-7.00 mg/day after 5-14 days of exogenous creatine (Kim et al., 2011). These levels did not reach the normal upper limit values in healthy humans, up to 35 mg/day (Mitchell and Zhang, 2001). Similarly, despite a 4.5-fold increase (mean 0.29 mg/day vs. 0.06 in basal state) the urine formate remained below the upper range (14-20 mg/day) reported in healthy subjects (Berode et al., 2000; Kage et al., 2004).

In summary, the above-referenced studies investigating methylamine and formaldehyde formation in relation to creatine intake were all performed at high doses of creatine, i.e. 20-

21 g/day. Intake of creatine monohydrate from the intended uses proposed in this dossier will lead to ingestion of only 0.6 g/day of creatine by average consumers and about 1.8 g/day by high level consumers. These creatine intake levels are similar to those from natural sources in the diet, such as meat, and generation of any methylamine and formaldehyde is expected to remain within normal ranges. Indeed, it was shown by Candow and coworkers that even in older men taking 8.4 g/day three days a week urinary formaldehyde production was not different from the placebo group (Candow et al., 2008).

5. Formation of heterocyclic amines

Heterocyclic amines are formed from creatine/creatinine, free amino acids and hexoses and they are produced during meat and fish cooking as by-products of the Maillard or browning reaction. Concern was raised by several review articles (Brudnak, 2004; Terjung et al., 2000; Wyss and Kaddurah-Daouk, 2000), that creatine supplementation could cause heterocyclic amine-induced carcinogenic/mutagenic effects in humans. A recent publication provides compelling evidence that low and high doses of creatine supplementation (7 and 20 g), taken acutely or chronically (1 and 30 days), are unrelated to the formation of carcinogenic heterocyclic amines in humans (Pereira et al., 2015). The individual analyses revealed that diet rather than creatine supplementation was the main responsible factor for heterocyclic amines formation. These findings refute the long-existing notion that creatine supplementation could potentially increase the risk of cancer by stimulating the formation of these mutagens.

Table 14: Summary of short- and long-term human safety trials with creatine monohydrate

Reference	Participant characteristics	Dose (g/d) and duration	Main end points	Effects/Risk Assessment
(Sales et al., 2019)	Postmenopausal females, aged 57 years. Double-blind randomized controlled trial.	3 g/d for 2 years	Bone health	No significant difference in blood concentrations of Ca, creatinine, ALT, ALP, AST, CK, markers of fat metabolism or urinary calcium, creatinine and albumin between the two study groups.
(Lobo et al., 2015)	Postmenopausal females, aged 58 years. Double-blind randomized controlled trial	1 g/d for 1 year	Body composition	No significant difference in body composition or blood concentrations of Ca, creatinine or urinary creatinine and albumin between the two study groups
(Chilibeck et al., 2015)	Postmenopausal females aged 57±6 years. Double-blind randomized controlled trial	0.1 g/kg bw/d for 1 year	Bone health, body composition	No differences between groups for reports of serum liver enzyme abnormalities, and creatinine clearance was normal throughout the intervention
(Pereira et al., 2015)	Cross-over study of healthy 10 females and 11 males; aged 29±4 yrs	7 g/d for 7 days, then 2 g/d for 23 days	Production of heterocyclic amines	No significant difference in urinary heterocyclic amines between creatine and placebo groups
(Cooke et al., 2014)	20 healthy males aged 55-70 years. Double-blind randomized trial	20 g/d for 7 days then 0.1 g/kg bw on training days (3 per week) for 12 weeks	Body composition and muscle strength	No significant difference in body composition , muscle strength, blood concentrations of Insulin-like growth factor 1(IGF-1) or testosterone between groups
(Lugaresi et al., 2013)	26 young healthy males engaged in resistance training and consuming a high-protein diet. Double-blind randomized trial	20 g/d for 5 days followed by 5 g/d up for 12 weeks	Kidney function	No significant difference in glomerular filtration rate (^{51}Cr-EDTA clearance). Creatinine clearance, serum and urinary urea, electrolytes, proteinuria and albuminuria were unchanged
(Atashak and Jafari, 2012)	18 young male soccer players	0.3 g/kg bw/d for 1 week	Markers of cellular damage: creatine phosphokinase (CK) and its myocardial isoform (CKMB)	Significantly increased activity of creatine CK and CKMB in the intervention group The increase in CKMB in the creatine supplemented group was only from 20 to 22 IU/l, the corresponding ratio of CKMB to CK was 0.06. It could not be concluded that the increase in CKMB reflects tissue injury

Reference	Participant characteristics	Dose (g/d) and duration	Main end points	Effects/Risk Assessment
(Neves et al., 2011)	Postmenopausal females aged 58±3 years	20 g/d for 1 week then 5 g/d for 11 weeks	Glomerular filtration rate (GFR), creatinine clearance	No significant difference in GFR. No difference in serum creatinine or urea. No difference in urinary creatinine or urea
(van der Merwe et al., 2009)	20 health male rugby players aged 18-19 years. Double-blind crossover randomized controlled trial	25 g/d for 7 days followed by 5 g/d for 14 days	Ratio of dihydrotestosterone (DHT) to testosterone (T)	The ratio of DHT:T increased significantly after creatine supplementation
(Ostojic and Ahmetovic, 2008)	59 male soccer players. Double-blind placebo randomized controlled trial	2 x 5 g daily or 1 x 10 g daily for 28 days	Perceived effects on gastrointestinal system	Diarrhea was significantly more pronounced in the 1 x 10 g group (55%) than in placebo (35%) and the 2 x 5 g group (28%) No other significant signs or gastrointestinal discomfort were observed. No other adverse effects were mentioned
(Gualano et al., 2008)	18 healthy males aged 18-35 years. Double-blind randomized placebo-controlled trial	10 g/d for 3 months	Renal function; serum creatinine, urinary sodium and potassium and cystatin C (GFR)	No significant difference in any of the measured markers (cystatin C, urinary Na and K) was observed between the two study groups Decreased cystatin C in both groups suggests improved renal function due to training. While serum creatinine decreased significantly in the placebo group, no significant changes were observed in blood cystatin C or urinary potassium or sodium between the two study groups
(Cancela et al., 2008)	14 male soccer players. Double-blind randomized placebo-controlled trial	15 g/d for 7 days then 3 g/d for 49 days	Biomarkers of renal and hepatic function	No significant difference in blood or urine markers of liver and renal function between the study groups
(Armentano et al., 2007)	35 healthy males and females aged 22-33 years. Double-blind randomized cross-over trial	20 g/d for 7 days	Exercise performance, renal function and blood pressure	No significant difference in exercise performance or blood pressure between the groups; creatine group had significantly higher serum creatinine

Reference	Participant characteristics	Dose (g/d) and duration	Main end points	Effects/Risk Assessment
(Poortmans et al., 2005)	20 healthy males aged 24.1±1.3 years. Double-blind randomized cross-over trial	21 g/d for 14 days	Biomarkers of renal function	Increased blood and urine creatine in the intervention group, but no change in creatinine or urinary albumin. Urinary excretion of methylamine and formaldehyde increased significantly in the intervention group
(Murphy et al., 2005)	Prospective study of 18 healthy males performing a cycling exercise	20 g/d for 7 days then 10 g/d for 21 days	Cardiac function	No significant difference in echocardiographic evaluation of the heart or blood pressure between groups
(Schröder et al., 2005)	18 healthy professional male basketball players, aged 24±4 years	20 g/d for 5 days, then 5 g/d. 3 seasons, each lasting 8 months	Clinical health parameters	No abnormal values detected for creatinine, lipids or liver enzymes. Intake of creatine did not alter clinical indices related to hepatic and renal pathology or muscle injury
(Santos et al., 2004)	Prospective study of 34 healthy male athletes aged 21.4-30.1 years running a 30 km race	4 x 5 g daily for 5 days	Inflammation markers	In the control group creatine kinase, lactate dehydrogenase, prostaglandin E2 and tumor necrosis factor alpha increased significantly compared to the creatine group. No adverse effects observed in any of the groups
(Kreider et al., 2003)	98 male college football players aged 18-23 years	15.75 g/d for 5 days, then ca. 5-10 g/d for 21 months	Clinical markers of health	No significant difference in the 54-item panel of blood and urine markers
(Schilling et al., 2001)	Retrospective study of 8 female and 18 male athletes, mean age 24 years	Loading 13.7 + 10.1 g/day; maintenance 9.7 +5.7 g/day. Total 0.8-4 years	Biomarkers for organ functions	No clinical adverse effects were found (based on a questionnaire) and no abnormal biomarker values of liver (enzymes) or renal (creatinine) function were noted
(Mihic et al., 2000)	15 females and 15 males, aged 21-23 years. Randomized cross-over trial	4 x 5 g daily for 5 days	Total and lean body mass	No significant difference in creatinine, creatine kinase or blood pressure between intervention- and control groups

Reference	Participant characteristics	Dose (g/d) and duration	Main end points	Effects/Risk Assessment
(Robinson et al., 2000)	23 male and 25 female healthy individuals, mean age 22-27 years	4 x 5 g daily for 5 days, or 4 x 5 g for 1 day then 3 g/day for 8 weeks	Biomarkers for organ functions	No significant difference in blood concentrations of biomarkers for hematological (blood cell counts), renal (urea, creatinine), hepatic (albumin, bilirubin) or skeletal muscle function (creatine kinase) after supplementation of creatine
(Poortmans and Francaux, 1999)	8 male and 1 female athlete aged 24±3 years	10g/d for 10 months to 5 years	Biomarkers of renal function	Plasma contents, urine excretion rates and clearance rates of creatinine, urea and albumin were not significantly different from the control.
(Poortmans et al., 1997)	5 healthy males aged 25.1±2.7 years	20g/d for 5 days	Biomarkers of renal function	Arterial and urine creatinine values, creatinine clearance, total protein and albumin excretion rates were not significantly different from the control

D. TOXICOLOGICAL STUDIES

The safety assessment provided above is corroborated by studies conducted by the Notifier specific to Creapure®. An Ames test, an *in vitro* micronucleus test, a mammalian cell gene mutation assay, acute dermal, oral and intraperitoneal (i.p.) toxicity and a 28-day oral toxicity trial using Creapure® creatine monohydrate as the test substance were performed in accordance with EU and OECD guidelines and taking into account Good Laboratory Practices (IUCLID, 2019; Mertschenk et al., 2001). The toxicological safety profile of creatine monohydrate can be viewed on the website of the European Chemicals Agency[5].

The Ames test was performed with the *Salmonella typhimurium* strains TA 1535, TA 1537, TA 100 and TA 98. Test concentrations of creatine monohydrate ranged from 100 to 5000 µg/plate. Testing was conducted with and without metabolic activation (S9 mix). Creatine monohydrate did not result in greater than normal revertant colony counts and is therefore not mutagenic under the conditions of the study.

The *in vitro* micronucleus test was performed using human peripheral lymphocytes. The test was conducted with and without metabolic activation for treatment periods of 4 and 18 hours at concentrations ranging from 190 to 1490 µg/ml. No cytotoxic effects were observed and formation of micronuclei in human lymphocytes was not observed in this *in vitro* experiment at any of the experimental settings. Therefore, creatine monohydrate was considered as "not genotoxic under the conditions of the test".

The cell gene mutation assay at the thymidine kinase locus (TK+/-) was performed using mouse lymphoma L5178Y cells. The test was conducted with and without metabolic activation for treatment periods of 4 and 24 hours at concentrations ranging from 93.8 to 1500 µg/ml. No cytotoxic effects and no increase in mutant colony numbers was observed in either of the experimental settings. Therefore, creatine monohydrate was considered to be non-mutagenic in this mouse lymphoma assay.

In the three acute toxicity studies groups of three or five male and female animals (Sprague Dawley rats for dermal toxicity, Wistar rats for oral toxicity, Swiss CD 1 mice for i.p. toxicity) were administered 2000 mg/kg body weight of creatine monohydrate either as solid substance on a cellulose patch which was soaked with water (dermal application) or as an aqueous solution by stomach tube or by i.p. application. All animals survived the

[5] https://echa.europa.eu/de/registration-dossier/-/registered-dossier/12796

treatment without any signs of toxic effects (observation period: 15 days). The dermal and oral LD_{50} (rat) and the i.p. LD_{50} (mouse) are greater than 2000 mg/kg body weight.

The 28-day oral toxicity trial was conducted with groups of 5 male and 5 female Wistar rats. Creatine monohydrate was administered as an aqueous preparation by stomach tube at doses of 0, 250, 500, 1000 and 2000 mg/kg body weight. The treatment was tolerated without any apparent signs of toxicity and autopsy of the sacrificed animals did not reveal any remarkable macroscopic and microscopic findings. Therefore 2000 mg/kg body weight/day is considered the No Observed (Adverse) Effect Level (NO(A)EL).

EFSA reviewed the toxicological information presented above and was able to conclude that the safety of creatine monohydrate (of adequate purity) in foods for particular nutritional uses is not a matter of concern (EFSA Panel on food additives, flavourings, processing aids and materials in contact with food (AFC), 2004).

In addition to the above-mentioned studies reported by Mertschenk *et al.*, 2001, there are several additional published studies in rodents which were not performed as traditional toxicological studies applying recognized standards but nevertheless evaluated certain safety parameters. Ju *et al.*, 2005 included creatine monohydrate (2 %) in the chow of female Wistar rats for 3 weeks and reported no negative effects on the rats. Guinea pigs, mice and rats fed 1.3 to 2 g/kg body weight/day of creatine monohydrate (corresponding to 140 g/day for a 70-kg person) for 2 to 8 weeks showed significant augmentation of total tissue creatine concentrations and no negative effects on body weight of the animals (Ipsiroglu et al., 2001). Recently, Sartini *et al.* investigated the effects of maternal creatine supplementation (1g/100 mL in drinking water from the eleventh day of pregnancy until delivery) on morpho-functional development of hippocampal neurons in the rat offspring (Sartini et al., 2016). The authors reported no difference between ponderal growth rates of creatine-supplemented and unsupplemented animals. Survival rate, weight of the pups at birth and litter size were unaffected by creatine supplementation, and no teratogenic effect was observed in the creatine group. The timing of major maturational steps in the offspring, i.e. hair coat development, eye opening and onset of movement control did not show differences between groups.

The *in vitro* and *in vivo* studies described above demonstrate that creatine monohydrate is not genotoxic and a NOAEL could be established at the highest dose tested in a 28-day rat study: 2 g per kg body weight per day. The absence of additional long-term studies in animals is not an important factor for this assessment for several reasons: creatine is an endogenous substance produced, metabolized and excreted by humans through well-known pathways; the intended use level of creatine in food is 1 g per portion of selected

food categories leading to an average consumer exposure of 0.6 g/d (combination of natural and added creatine) which is in the range of intake levels of creatine from natural food sources (meat and fish); and because there is a wealth of studies of creatine monohydrate intake by people of a wide age range and health status.

E. DIETARY UPPER SAFE LEVEL FOR CREATINE INTAKE

The safety evaluation method applied to oral creatine monohydrate intake is from the Council for Responsible Nutrition which includes the basic features of the risk assessment models used by the US Food and Nutrition Board (FBN).

None of the human clinical trials in the publicly available literature have reported a clear adverse effect related to creatine administration. There is, therefore, by definition, no basis for identifying a Lowest Observed Adverse Effect Level (LOAEL). In the absence of a LOAEL, a NOAEL is not usually set. Without either of these two values the establishment of a safe Upper Level of Intake (UL) usually is not set.

If no data establish adverse effects in humans, the highest intake level with sufficient evidence of safety is set as the Observed Safe Level (OSL). This process has been described by Shao and Hathcock in 2006 in their evaluation of the safety of creatine monohydrate (Shao and Hathcock, 2006). The absence of any pattern of adverse effects related to creatine monohydrate intake in any of the published trials provides support for the high level of confidence in the safety of this compound. Based upon the publicly available literature the OSL for creatine monohydrate is 5 g/d. A correction of the OSL for normal dietary intake of creatine was not necessary as the 5 g/d dose was administered to subjects eating normal diets (including creatine).

Considering an OSL of 5 g/d, there is a reasonable certainty that creatine monohydrate is not harmful under the conditions of its intended use as described in section 1.D of this dossier.

F. ALLERGENICITY

Creatine monohydrate as such is not classified as an allergen, and when manufactured applying proper hygienic principles and HACCP measures does not contain or come in contact with food allergens.

Mertschenk and coworkers described tests of primary skin and eye irritation (OECD 404) in New Zealand white rabbits and testing for the allergenic potential of creatine

monohydrate according to the Magnusson-Klingman maximization sensitization test in albino guinea pigs (OECD 406) (IUCLID, 2019; Mertschenk et al., 2001). Creatine monohydrate did not result in any skin nor eye reactions nor was a hypersensitivity observed.

G. QUALITY OF THE SUBSTANCE

Creapure® creatine monohydrate as manufactured by AlzChem is synthesized from the raw materials sodium sarcosinate and cyanamide in a well-controlled process. For production of Creapure® HACCP and Preventive Controls principles are applied. The manufacturing process yields creatine monohydrate of a very high quality of ≥ 99.9%.

The level of by-products, heavy metals and microbiological contamination is controlled in accordance with the specification provided in **Section 2.B**. The level of creatinine is limited to ≤ 100 mg/kg. Creatinine is a physiological compound and the natural degradation product of creatine (see **Section 6.B**). The substance is not of toxicological concern, and the specified limit is set as a quality indicator proving gentle and proper product handling. The by-product dicyandiamide (DCD) may be present at a level of up to 50 mg/kg. Risk assessment of the substance was performed by comparison of the maximum daily intake of DCD from creatine monohydrate with the permitted daily exposure (PDE) calculated for DCD. Considering a low and high intake scenario for creatine monohydrate, the intake of dicyandiamide remained far below the PDE value for this substance (***Table 15***). The by-product dihydro-1,3,5-triazine (DHT) cannot occur under the manufacturing conditions used by the Notifier (see **Section 2.E**), however, AlzChem includes a specification for the substance as a quality measure. Risk analysis of DHT was performed applying the TTC (threshold of toxicological concern) approach (EFSA and WHO, 2016). The Toxtree Software Version 3.1.0 was used to calculate the Cramer class[6], the potential genotoxicity[7] and finally the TTC[8]. The substance is categorized in Cramer class III with a TTC reference value of 1.5 µg per kg body weight per day. Assuming a body weight of 50 kg the daily threshold value for DHT is 75 µg, and hence, the maximal possible intake of DHT from consumption of creatine monohydrate remains below this daily reference value. Levels for

[6] Decision tree: Cramer rules, with extensions
[7] Decision trees: carcinogenicity (genotox and non-genotox) and mutagenicity rule base by ISS (Istituto Superiore di Sanita http://www.iss.it/); In vitro mutagenicity (Ames test) alerts by ISS
[8] Decision tree: Kroes TTC decision tree

heavy metals fulfill requirements as given in European legislation and are appropriate for a food grade material.

Table 15: Estimated intakes of impurities from Creapure® creatine monohydrate

Impurity & specified limit in Creapure®	**Intake of the respective impurity when consuming a certain amount of Creapure® creatine monohydrate**		**Permitted daily exposure (PDE)**	**Daily threshold value (TTC)**
	0.56 g/d (low level) Cr MH	2.24 g/d (high level) Cr MH		
Creatinine ≤ 100 mg/kg	Quality indicator; not of toxicological concern			
DCD ≤ 50 mg/kg	max. 0.028 mg/d	max. 0.112 mg/d	529[1] mg/d	
DHT ≤ 3 mg/kg	max. 1.7 µg/d	max. 6.7 µg/d		75 µg/d

[1] The PDE was calculated from the NOAEL of 529 mg/kg/day (males; more sensitive species) derived from a 2-year repeated dose study in rats. Summary information can be found at: https://echa.europa.eu/de/registration-dossier/-/registered-dossier/15751/7/8 (information retrieved on 04-05-19); PDE = (NOAEL x weight) / (F1 x F2 x F3 x F4 x F5) with weight = 50 kg, F1 = 5, F2 = 10, F3 = 1, F4 = not applied, F5 = 1.

[2] The by-product dihydro-1,3,5-triazine (DHT) cannot occur under the manufacturing conditions used by the Notifier, however, the Notifier includes a specification for the substance as a quality measure.

The creatine monohydrate evaluated by EFSA in 2004 had a minimum purity of 99.95 %. Maximum limits for the impurities creatinine (100 mg/kg), dicyandiamide (50 mg/kg) and dihydro-1,3,5-triazine (not detectable; the LOD was given as 4.5 mg/kg) were considered acceptable with regard to the safety of the substance (EFSA Panel on food additives, flavourings, processing aids and materials in contact with food (AFC), 2004).

Overall, Creapure® creatine monohydrate as described in this dossier is a highly purified substance and safe for human consumption. It is of similar quality as the material evaluated by EFSA in 2004.

H. SPECIFIC JURISDICTION'S REGULATORY STATUS OF CREATINE MONOHYDRATE

Creatine is a natural compound in the food supply and a normal dietary experience to humans. Creatine can also be consumed as a dietary supplement or (functional) food ingredient, and is then obtained from chemical synthesis. Synthetic creatine is structurally identical to natural creatine. The standard form of synthetic creatine is creatine monohydrate. Creatine monohydrate is the most studied form of creatine with a large available database of safety information as it is a popular dietary supplement for athletes and recreationally active people.

Its use in human nutrition as an ingredient in food and in dietary/food/health supplements is regulated in various ways by different countries according to their respective regulatory system as described below.

USA

According to the Dietary Supplement Health and Education Act of 1994 (DSHEA), supplement manufacturers do not need to receive FDA approval before marketing dietary supplement ingredients that were marketed in the US before October 15, 1994. Creatine monohydrate first appeared on the US market in 1993 and the same chemical form has been present in the food supply since that time. Creatine monohydrate is listed in the Old Dietary Ingredients List and is considered "grandfathered" (Council for Responsible Nutrition, September 1998; United Natural Products Alliance, 2011).

EU

In the European Union, Commission Directive 2002/46/EC (European Parliament, 10.06.2002) lays down rules for the placing of food supplements on the market whereas Regulation (EC) 1925/2006 (European Parliament, 20.12.2006b) lays down rules on the addition of vitamins and minerals and of certain other substances to foods. Within both regulatory frameworks other substances are described as substances other than vitamins and minerals that have a nutritional and/or physiological effect, which also includes creatine monohydrate. Both laws define EU-wide harmonized lists for the use of vitamins and minerals in food supplements but "other substances" are not harmonized in a similar way. Nevertheless, creatine monohydrate is a permissible substance within the class of "other substances", and some EU member states already have published positive lists of permitted "other substances". For example, the Spanish Authorities recently published their list of "other substances" with nutritional or physiological effects that may be used in the production of food supplements, which lists creatine monohydrate with a maximum

daily intake of 3g (Ministerio de la Presidencia y para las administraciones territoriales, 27.03.2018).

In addition, two approved health claims are authorized for creatine within the regulatory framework of regulation (EC) 1924/2006 (European Parliament, 20.12.2006a) on nutrition and health claims made on foods, linking creatine intake in combination with exercise to improved physical performance. One health claim specifically targets the application of creatine in the elderly.

Canada

Under Canadian food law creatine monohydrate is considered to be an ingredient for natural health products. Natural health products must be licensed and approved. An entry for creatine monohydrate is included in the Canadian Natural Health Products Ingredients Database and a Single Ingredient Monograph has been prepared[9]. Creatine monohydrate is included in the group of non-caffeinated ergogenic agents for use in workout supplements[10].

Japan

In Japan creatine monohydrate is considered as food substance within the legal framework of the Food Sanitation Act (Ministry of Health, Labour and Welfare, 26.03.2014).

As compounds cannot be both, food and drug substance creatine is classified as non-drug substance.

I. RISK ASSESSMENTS OF CREATINE MONOHYDRATE BY GOVERNMENTAL SCIENTIFIC BODIES

Risk assessments of the safety of use of creatine monohydrate by humans have been performed by the Scientific Committee for Food (SCF) in 2000, the European Food Safety Authority in 2004, the Norwegian Scientific Committee for Food Safety (VKM) in 2010 and 2016 and the Spanish Agency for Food Safety and Nutrition (AESAN) in 2014. The conclusions of each of the assessments are summarized below.

[9] Health Canada. Drug and Health Products. Natural Health Ingredients Database, Creatine Monohydrate (http://webprod.hc-sc.gc.ca/nhpid-bdipsn/atReq.do?atid=creatine.mono&lang=eng)
[10] Health Canada. Drug and Health Products. Natural Health Ingredients Database, Workout Supplements (http://webprod.hc-sc.gc.ca/nhpid-bdipsn/atReq.do?atid=workout.supplements.entrainement&lang=eng)

SCF 2000

In 2000, the Scientific Committee on Food (SCF) assessed the safety aspects of creatine supplementation (safety for specific population groups, e.g. children, elderly and other vulnerable groups was not assessed) (Scientific Committee on Food (SCF), 2000). The Committee noted that there was little information on the short-term or long-term safety of creatine, there was a lack of large-scale, well-controlled studies and available results observed in highly trained athletes cannot necessarily be extrapolated to the general public. Based upon the available information, the SCF advised that high loading doses should be avoided, but that consumption of doses up to 3 g/day are similar to the daily turnover rate of about 2 g/day and are unlikely to pose any risk.

EFSA 2004

In 2004, the European Food Safety Authority (EFSA) delivered an opinion on the safety and bioavailability of the nutrient source creatine monohydrate when used in the manufacture of foods for particular nutritional purposes (EFSA Panel on food additives, flavourings, processing aids and materials in contact with food (AFC), 2004). The creatine monohydrate assessed by the Panel was of high purity (minimum 99.95%), was produced under conditions that prevent microbiological and heavy metal contamination, and acceptable limits for the impurities creatinine, dicyandiamide and dihydro-1,3,5-triazine were given. The Panel agreed with the SCF that high loading doses should be avoided, but they were also able to conclude that the safety and bioavailability of creatine monohydrate in foods for particular nutritional uses was not a matter of concern and that consumption of up to 3 g/day of supplemental creatine is unlikely to pose any risk.

VKM 2010

In 2010, the Norwegian Scientific Committee for Food Safety (VKM) conducted an assessment of creatine in sports products (e.g. supplements) that included an evaluation of safety and possible risks of creatine supplementation (Norwegian Scientific Committee for Food Safety (VKM), 2010). The Panel supported the EFSA conclusion that supplementation with creatine of adequate purity in doses up to 3 g/day is unlikely to pose any risks. While scientific long-term studies with doses up to 5-10 g/day of creatine (as creatine monohydrate) in adult athletes have shown no harmful effects, there are no dose-response studies indicating a safe upper limit for creatine. The potential negative effects (e.g. impaired kidney function, weight gain and gastrointestinal disturbances) reported in non-scientific journals and anecdotal reports are not supported by controlled systematic studies on healthy subjects. The Panel noted that a growing number of studies are

supporting the use of creatine in elderly, but no studies have been found on possible adverse effects on creatine supplementation on healthy children or adolescents.

AESAN 2012

As part of a report on the conditions of use of certain substances other than vitamins, minerals and plants in food supplements, the Spanish Agency for Food Safety and Nutrition (AESAN) evaluated the characteristics, sources, nutrition, metabolism and safety of 49 substances and concluded on the safety for use as a food supplement (Scientific Committee of AESAN, 2012). The safety for specific population groups, e.g. children, elderly and other vulnerable groups was not within the scope of their evaluation. In their risk assessment of creatine monohydrate the Committee concluded that the maximum amount of 3 g/day creatine monohydrate proposed by the AESAN was acceptable from a safety point of view as a food supplement.

VKM 2016

Recently, the Norwegian Scientific Committee for Food Safety (VKM) assessed the safety of creatine as a food supplement at the dose levels of 3, 5, 10 and 24 g/day and was able to conclude that in adults (≥18 years) a daily dose of 3 g/day creatine in food supplements is unlikely to cause adverse health effects (Norwegian Scientific Committee for Food Safety (VKM), 2016). The documentation for absence of adverse health effects of higher doses in food supplements in the general population is limited; hence, these doses may represent a risk of adverse health effects in adults. The Committee also performed a literature search specifically for children and adolescents but due to insufficient data they were not able to conclude on the safety of creatine in food supplements in these age groups.

J. CONCLUSIONS ON THE SAFETY OF USE OF CREATINE MONOHYDRATE IN FOOD

Creatine is a natural compound in the food supply and a normal dietary experience to humans. It is an endogenous substance and a nutrient commonly consumed by humans at levels of up to ~1.5 g/d for high level intakes from natural sources. Dietary creatine serves the same physiological role as endogenous creatine. Humans and other vertebrates efficiently adsorb, metabolize and excrete creatine and excess creatine that is consumed is excreted unchanged in the urine. The bioavailability of creatine monohydrate and creatine is considered to be the same.

Creatine monohydrate is a permissible substance in countries around the world for use in health/dietary supplements and food. It has been assessed for safety by numerous authorities between the years 2000 and 2016 all reaching the same conclusion that a daily dose of around 3 g of creatine or creatine monohydrate in addition to normal dietary creatine is unlikely to pose a risk to healthy adults.

Systematic studies on the safety for healthy children are lacking, however, the proposed use categories (e.g. protein powders, protein bars, meal replacement products) will not normally be consumed by children and the intended use of creatine in food does not cover infant nutrition. Nevertheless, it is important to note that children are naturally exposed to creatine by ingestion of meat and fish, and the mean creatine intake from natural sources in children ranges from 0.2 g to 0.3 g of creatine and may increase to 0.5 g to 0.7 g for high level consumers (see intake assessment in **Section 3.C** and **Annex 2**).

In humans, the physiological consequence of creatine ingestion may be an increase in creatine and/or creatinine concentrations in the blood and urine, while having no negative effects on kidney or liver function. Other potential adverse effects have also not been supported by controlled systematic studies on healthy subjects. Studies in animals show that creatine monohydrate does not exhibit an active toxicity and provide additional support that creatine ingestion at doses analogous to or higher than those ingested by humans do not cause adverse effects in most animals under normal conditions.

Risk assessment of nutrients and related substances generally includes calculation of a safe Upper Level of intake (UL)[11] based upon an adverse effect related to consumption of the substance. The published human trials involving creatine monohydrate ingestion lack any pattern of adverse effects related to creatine monohydrate consumption and therefore do not provide a basis for calculation of an UL. In these circumstances, as described by Shao and Hatchcock (Shao and Hathcock, 2006), it is more appropriate to identify the highest intake level with significant evidence of safety as the Observed Safe Level (OSL) also called the Highest Observed Intake (HOI) by the FAO/WHO (FAO/WHO, 2006). The trials in healthy adults evaluated by Shao and Hathcock and described in this dossier demonstrate that no adverse effects were observed when 5 g/d of creatine (on top of normal dietary creatine) was ingested over a long timeperiod.

[11] Upper level of intake is defined as the maximum level of habitual intake from all sources of a nutrient or related substance judged to be unlikely to lead to adverse health effects in humans (FAO-WHO, 2006)

When creatine monohydrate is included in the proposed food categories described in this dossier at the intended use level to provide 1 g of creatine per portion, and considered in conjunction with consumption of naturally present creatine in food, average consumers will be exposed to around 0.6 g/day of creatine and high level consumers will be exposed to about 1.8 g/day. These creatine intakes are similar to the creatine intake from natural sources and are below the dose of 3 g/day considered by the risk assessment authorities to have no negative effects on adults, and well below the Observed Safe Level (OSL) of 5 g/d.

The data and information summarized in this dossier demonstrate that there is reasonable certainty that creatine monohydrate (Creapure®), as manufactured by AlzChem, produced using current Good Manufacturing Practices and meeting appropriate food-grade specifications, is not harmful under the conditions of its intended use in foods, as described herein.

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ANNEX 1: CERTIFICATES OF ANALYSIS FOR CREAPURE® CREATINE MONOHYDRATE

AlzChem

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Date: 2019-01-29
Page 1 of 2

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**821141**
Production Date:	30.07.2018
Retest Date:	30.07.2021
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	102.5
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	54
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	20
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

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Office USA: AlzChem LLC, 680 Village Trace, Bldg. 20, Ste. A, Marietta, GA 30067, USA
Phone 770-804-0371, Fax 770-804-0375

AlzChem

AlzChem Trostberg GmbH - Postfach 1162 - 83303 Trostberg / Germany

Date: 2019-01-29
Page 2 of 2

Periodic controls

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.12	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [1]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [1]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [1]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [1]

[1] Limit of Detection, [2] Ph. Eur. methods harmonised with USP methods

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2560.

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Analytical Department

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AlzChem

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Date: 2019-01-29
Page 1 of 2

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**821241**
Production Date:	31.07.2018
Retest Date:	31.07.2021
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	101.8
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	58
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	19
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

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AlzChem

Date: 2019-01-29
Page 2 of 2

Periodic controls

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bactena	Ph.Eur. 2.6.12	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[3] Limit of Detection; [2] Ph. Eur. methods harmonised with USP methods

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

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AlzChem

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Date: 2019-01-29
Page 1 of 2

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**821341**
Production Date:	01.08.2018
Retest Date:	01.08.2021
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	102.1
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	40
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	19
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

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AlzChem

AlzChem Trostberg GmbH - Postfach 11 62 - 83308 Trostberg - Germany

Date: 2019-01-29
Page 2 of 2

Periodic controls

Microbiology

Parameter	Method [1]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.12	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [2]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [2]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [2]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [2]

[1] Limit of Detection; [2] Ph. Eur. methods harmonised with USP methods

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

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ANNEX 2: POTENTIAL EXPOSURES TO CREATINE FOR AMERICAN CONSUMERS

Potential Exposures to Creatine for American Consumers

David R Tennant

9th February 2018

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Potential Exposures to Creatine for American Consumers

Introduction

Creatine is proposed as a food ingredient in energy drinks, protein bars, milk shakes, protein powders, meal replacement powders and bars, meat analogues and dry mix drinks. To determine safe conditions of use it is necessary to assess the effect of the proposed use on potential consumer exposures. The USA FDA Center for Food Safety and Applied Nutrition's Guidance[i] for industry on estimating dietary intake of substances in food recommends the use of USDA's What We Eat in America (the dietary intake interview component of the National Health and Nutrition Examination Survey, NHANES) for dietary exposure assessment. This approach has been endorsed in a more recent review of methods used by FDA to assess exposure to food additives[ii].

The NHANES data provide a record of the quantity of each of over 8,500 different food descriptions consumed on every eating occasion on two non-consecutive days by more than 10,000 US citizens. The quantities consumed and the numbers of eating occasions are both used to estimate exposures to creatine in this report.

Materials and methods

Levels of natural creatine in foods

Creatine occurs naturally in a wide range of animal products. A literature study and laboratory analyses have been used to establish levels of creatine in animal-derived food products (Annex A). The average concentrations of creatine in each food category are provided in Table 1.

Table 1. Average concentrations of creatine in animal products.

Food category	Creatine g/kg
Beef	3.90
Dairy	0.09
Fish	4.46
Ham	1.91
Lamb	4.71
Liver	0.13
Pork	3.45
Poultry	4.06
Sausage	2.18

Proposed additions of creatine to selected foods

It is proposed that creatine will be added to foods in specific categories to provide an intake of 1g from a single portion. Foods will be presented in single portion packs or recommended portions sizes will be provided on packaging.

Creatine will only be added to foods for which a standard of identity does not exist.

Table 2. Proposed use categories for creatine

Food category	**Notes**
Energy drinks	RTD (powders, tablets) including sports drinks
Protein bars	Including breakfast bars
Milk Shakes	Excluding slimming / meal replacement products
Protein powders	Including soy-based
Meal replacement	Powders and bars
Meat analogues	Egg and meat substitutes
Dry mix drinks	Excluding meal replacements and instant coffee

Food consumption data

The food consumption profiles (amount consumed and frequency of consumption) of individuals in NHANES 2013-2014[iii] were used to calculate the estimated daily intake (EDI) of creatine from natural sources and from additional uses. For this GRAS evaluation, exposure was based on individuals consuming the food groups containing either natural creatine (Table 1) or selected for the addition of creatine (Table 2) (i.e. "eaters only") at the given use levels.

Food consumption and biometric data from the 2013-14 NHANES dataset were extracted into a Microsoft Access database. Food categories listed in Tables 1 and 2 were linked to specific food descriptions in the NHANES system (Annex B). The numbers consuming each food category, average and 90th and 95th percentiles of food consumption were then calculated for each age group (Tables 3 and 4).

Modelling consumer exposures to creatine

Average natural occurrence levels from Table 1 were combined with NHANES food consumption data to estimate each individual's average daily intake of natural creatine from each food group and from all groups combined. The population average, 90th and 95th percentiles for all individuals in each age category were then estimated.

For each food falling into the categories for new uses listed in Table 2 it was assumed that consumption on each and every eating occasion reported in the survey would result in an intake of 1g creatine. The actual quantities consumed (Table 4) were not used in the calculation. Each individual's average total daily intake of added creatine from each food group and from all groups combined was then calculated. The population average, 90th and 95th percentiles for all individuals in each age category were then estimated.

Table 3. Consumption of animal products containing creatine

Age group		Food consumption, g/day								
		BEEF	**DAIRY**	**FISH**	**HAM**	**LAMB**	**LIVER**	**PORK**	**POULTRY**	**SAUSAGE**
ALL	N consumers	2243	6945	1062	1784	49	21	1641	3845	1407
	% consumers	22.0%	68.3%	10.4%	17.5%	0.5%	0.2%	16.1%	37.8%	13.8%
	Mean	65	233	97	41	55	46	36	77	39
	P90	134	534	204	84	105	92	84	153	75
	P95	172	687	255	112	124	139	121	201	105
1 to 2	N consumers	74	456	31	70	0	0	55	264	112
	% consumers	7.8%	48.3%	3.3%	7.4%	0.0%	0.0%	5.8%	27.9%	11.9%
	Mean	29	425	33	21			20	39	29
	P90	53	873	57	44			40	84	57
	P95	72	1017	71	56			70	97	69
3 to 9	N consumers	229	1088	104	240	3	1	179	625	214
	% consumers	14.5%	68.7%	6.6%	15.2%	0.2%	0.1%	11.3%	39.5%	13.5%
	Mean	39	319	58	31	35	4	25	57	37
	P90	77	600	102	57	54	4	58	108	70
	P95	101	717	148	84	57	4	69	134	106
10 to 17	N consumers	376	1174	102	323	2	3	202	636	177
	% consumers	24.5%	76.5%	6.6%	21.1%	0.1%	0.2%	13.2%	41.5%	11.5%
	Mean	64	265	84	40	90	38	35	82	36
	P90	119	565	170	84	135	59	76	168	75
	P95	158	684	226	100	141	61	100	209	101
18 to 64	N consumers	1269	3318	624	895	38	9	916	1868	694
	% consumers	26.4%	69.0%	13.0%	18.6%	0.8%	0.2%	19.1%	38.9%	14.4%
	Mean	73	179	111	46	57	55	40	89	43
	P90	142	420	227	84	105	139	96	175	85
	P95	190	572	312	115	113	140	134	226	112
65+	N consumers	295	909	201	256	6	8	289	452	210
	% consumers	22.6%	69.6%	15.4%	19.6%	0.5%	0.6%	22.1%	34.6%	16.1%
	Mean	65	193	90	39	41	45	33	69	37
	P90	124	444	170	83	70	72	70	130	74
	P95	153	578	238	93	76	82	89	162	88

The approach applied follows FDA Guidance for Industry: Estimating Dietary Intake of Substances in Food[1] and in particular the case study on the carotenoid canthaxanthin, which appears in Appendix B of the Guidance. For food categories where there are less than 100 consumers estimates of upper percentiles may be unreliable.

Table 4. Consumption of food categories for addition of creatine (for information)

		Food consumption, g/day							
Age group		**Energy drinks**	**Protein bars**	**Milk Shakes**	**Protein powders**	**Meal replace-ment**	**Meat analogue**	**Dry mix drinks**	**All foods**
ALL	N consumers	710	676	297	109	129	86	562	2198
	% consuming	7.0%	6.6%	2.9%	1.1%	1.3%	0.8%	5.5%	21.6%
	Mean	421	27	175	43	138	65	236	241
	P90	775	48	345	71	341	115	449	543
	P95	1014	68	406	122	377	140	682	775
1 to 2	N consumers	18	27	14	3	1	2	43	92
	% consuming	1.9%	2.9%	1.5%	0.3%	0.1%	0.2%	4.6%	9.8%
	Mean	256	27	45	17	17	49	98	113
	P90	494	50	66	27	17	66	197	200
	P95	1000	57	112	29	17	68	244	313
3 to 9	N consumers	99	103	42	0	4	0	109	321
	% consuming	6.3%	6.5%	2.7%	0.0%	0.3%	0.0%	6.9%	20.3%
	Mean	257	25	133		34		130	149
	P90	532	41	243		58		291	372
	P95	716	59	308		61		372	496
10 to 17	N consumers	172	135	58	12	10	13	93	412
	% consuming	11.2%	8.8%	3.8%	0.8%	0.7%	0.8%	6.1%	26.9%
	Mean	365	28	185	44	127	52	160	230
	P90	742	62	274	129	251	92	271	507
	P95	899	68	354	154	266	108	374	708
18 to 64	N consumers	399	364	142	80	95	61	241	1167
	% consuming	8.3%	7.6%	3.0%	1.7%	2.0%	1.3%	5.0%	24.3%
	Mean	494	28	183	47	140	66	316	283
	P90	962	48	378	71	346	115	667	655
	P95	1350	68	406	106	384	140	960	899

65+	N consumers	21	44	39	14	19	10	76	200
	% consuming	1.6%	3.4%	3.0%	1.1%	1.5%	0.8%	5.8%	15.3%
	Mean	402	24	226	21	160	77	303	227
	P90	775	35	386	45	329	130	569	494
	P95	775	43	481	59	345	141	743	746

Results

Total intakes of natural creatine from animal products ranged from about 0.2 g/day at the average for 1 to 2 year old children to 1.2 g/day at the 95th percentile for adults (Table 5). High fish consumers appeared to have the highest intakes followed by consumers of other meat products. Dairy products did not appear to make a significant contribution.

Table 5. Intakes of creatine from natural occurrence by US consumers

Age group		**Creatine intake g/day**									
		BEEF	**DAIRY**	**FISH**	**HAM**	**LAMB**	**LIVER**	**PORK**	**POULTRY**	**SAUSAGE**	**Grand Total**
ALL	% consuming	22.0%	68.3%	10.4%	17.5%	0.5%	0.2%	16.1%	37.8%	13.8%	78.8%
	Mean	0.25	0.02	0.43	0.08	0.26	0.01	0.12	0.31	0.08	0.36
	P90	0.52	0.05	0.91	0.16	0.49	0.01	0.29	0.62	0.16	0.79
	P95	0.67	0.06	1.14	0.21	0.58	0.02	0.42	0.82	0.23	1.04
1 to 2	% consuming	7.8%	48.3%	3.3%	7.4%	0.0%	0.0%	5.8%	27.9%	11.9%	53.4%
	Mean	0.11	0.04	0.15	0.04			0.07	0.16	0.06	0.17
	P90	0.21	0.08	0.25	0.08			0.14	0.34	0.12	0.37
	P95	0.28	0.09	0.32	0.11			0.24	0.39	0.15	0.46
3 to 9	% consuming	14.5%	68.7%	6.6%	15.2%	0.2%	0.1%	11.3%	39.5%	13.5%	71.7%
	Mean	0.15	0.03	0.26	0.06	0.16	0.00	0.09	0.23	0.08	0.25
	P90	0.30	0.05	0.45	0.11	0.25	0.00	0.20	0.44	0.15	0.53
	P95	0.39	0.07	0.66	0.16	0.27	0.00	0.24	0.54	0.23	0.68
10 to 17	% consuming	24.5%	76.5%	6.6%	21.1%	0.1%	0.2%	13.2%	41.5%	11.5%	84.2%
	Mean	0.25	0.02	0.38	0.08	0.42	0.00	0.12	0.33	0.08	0.34
	P90	0.46	0.05	0.76	0.16	0.64	0.01	0.26	0.68	0.16	0.75
	P95	0.62	0.06	1.01	0.19	0.66	0.01	0.35	0.85	0.22	0.94
18 to 64	% consuming	26.4%	69.0%	13.0%	18.6%	0.8%	0.2%	19.1%	38.9%	14.4%	83.7%

	Mean	0.28	0.02	0.50	0.09	0.27	0.01	0.14	0.36	0.09	0.42
	P90	0.55	0.04	1.01	0.16	0.49	0.02	0.33	0.71	0.18	0.91
	P95	0.74	0.05	1.39	0.22	0.53	0.02	0.46	0.92	0.24	1.22
65+	% consuming	22.6%	69.6%	15.4%	19.6%	0.5%	0.6%	22.1%	34.6%	16.1%	81.3%
	Mean	0.25	0.02	0.40	0.07	0.19	0.01	0.11	0.28	0.08	0.35
	P90	0.48	0.04	0.76	0.16	0.33	0.01	0.24	0.53	0.16	0.76
	P95	0.60	0.06	1.06	0.18	0.36	0.01	0.31	0.66	0.19	0.98

Intakes of creatine after addition of 1g per portion to selected food categories listed in Table 2 ranged from about 0.5 g/day for average consumers up to about 2g/day for high level consumers (Table 6). Intakes of less than 1g/day indicate that consumers consumed less than one portion of the foods listed in Table 2 on a daily basis.

Table 6. Intakes of creatine from addition of 1g per portion to selected foods.

Age group		Energy drinks	Protein bars	Milk Shakes	Protein powders	Meal replace-ment	Meat analogue	Dry mix drinks	All foods
ALL	% consuming	7.0%	6.6%	2.9%	1.1%	1.3%	0.8%	5.5%	21.6%
	Mean	0.8	0.7	0.6	0.8	0.8	0.6	0.8	0.9
	P90	1.5	1	1	1.5	1	1	1.5	1.5
	P95	2	1	1	1.5	1.5	1	2	2
1 to 2	% consuming	1.9%	2.9%	1.5%	0.3%	0.1%	0.2%	4.6%	9.8%
	Mean	0.9	0.8	0.6	0.7	0.5	0.8	1.0	1.0
	P90	2	1.5	1	0.9	0.5	1.0	1.5	2
	P95	2	1.9	1	1.0	0.5	1.0	2.5	2
3 to 9	% consuming	6.3%	6.5%	2.7%	0.0%	0.3%	0.0%	6.9%	20.3%
	Mean	0.7	0.7	0.6		1.1		0.9	0.8
	P90	1	1	1		2.1		1.5	1.5
	P95	1.6	1	1		2.3		2	2
10 to 17	% consuming	11.2%	8.8%	3.8%	0.8%	0.7%	0.8%	6.1%	26.9%
	Mean	0.7	0.7	0.6	0.8	0.5	0.6	0.7	0.8
	P90	1	1	0.7	1.5	0.5	0.9	1.0	1.5
	P95	1.5	1	1	1.7	0.5	1.0	1.5	1.7

18 to 64	% consuming	8.3%	7.6%	3.0%	1.7%	2.0%	1.3%	5.0%	24.3%
	Mean	0.8	0.7	0.6	0.8	0.8	0.6	0.7	0.9
	P90	1.5	1	1	1.1	1	1	1	1.5
	P95	2	1	1	1.5	1.5	1.0	1.5	2
65+	% consuming	1.6%	3.4%	3.0%	1.1%	1.5%	0.8%	5.8%	15.3%
	Mean	1.0	0.6	0.9	0.7	0.7	0.7	0.8	0.8
	P90	2.0	1	2.0	1.4	1.0	1.0	1.5	1.5
	P95	2	1	2	1.5	1.1	1	2	2

When natural occurrence (Table1) was combined with added usage at 1g per portion in selected food categories (Table 2), High level intakes ranged up to 1.8 g/day (Table 7). This is lower than the high level intakes from addition of creatine alone because the inclusion of large numbers of consumers with relatively low intakes from natural sources tends to lower the values of upper percentiles.

Table 7. Intakes of creatine from natural sources and the addition of 1g per portion to selected foods.

		Age group				
	All	1 to 2	3 to 9	10 to 17	18 to 64	65+
N	8082	506	1139	1302	1302	1067
% consuming	79%	54%	72%	85%	27%	82%
Mean	0.6	0.4	0.5	0.6	0.6	0.5
P90	1.4	1.0	1.2	1.3	1.3	1.2
P95	1.8	1.3	1.5	1.7	1.7	1.5

Conclusion

Natural intakes of creatine for American consumers average around 0.4 g/day and can be as high as 1.4 g/day for high consumers of fish. The addition of 1g creatine per portion of selected foods gives average intakes of around 1g per day rising to over 2 g/day for high level consumers of certain foods. When natural creatine and added creatine are combined, average intakes are about 0.5 g/day with high level intakes rising to around 1.8 g/day. This is because the numbers of consumers of product selected for addition of creatine are relatively low in comparison to consumers of animal products.

If consumers were aware of the addition of creatine to selected foods and altered their consumption of those foods accordingly, then total intakes of creatine would be expected to alter to reflect this change.

References

[i] USA Food and Drug Administration (2006). Center for Food Safety and Applied Nutrition. Guidance for Industry: Estimating Dietary Intake of Substances in Food. https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-estimating-dietary-intake-substances-food#appe

[ii] Alger HM, Maffini MV, Kulkarni NR, Bongard ED, and Neltner T (2013). Perspectives on How FDA Assesses Exposure to Food Additives When Evaluating Their Safety: Workshop Proceedings. Comprehensive Reviews in Food Science and Food Safety Vol.12, 90-110. doi: 10.1111/j.1541-4337.2012.00216.x.

[iii] Centers for Disease Control and Prevention, National Health and Nutrition Examination Survey 2013-14.
https://wwwn.cdc.gov/nchs/nhanes/search/datapage.aspx?Component=Dietary&CycleBeginYear=2013

ANNEX A

Creatine in meat and fish **LITERATURE DATA**

dm: dry mass; ww: wet weight

entry	species	food	muscle type	source	treatment	temperature	time	Creatine mg/100 g dm	Creatine mg/kg dm	Creatine mg/100 g ww	Creatine mg/kg ww	Creatinine mg/100 g dm	Creatinine mg/100 g ww	analytical method	further parameters	journal	year	volume, pages	author	
1	pork	dry-cured ham (11 month)						1028	10280			140								
2	pork	raw muscle	semimembranous							373	3730		9	HILIC	carnosine	Meat Science	2008	79, 709-715	Mora	
			biceps femoris							343	3430		8	HILIC						
			gluteus maximus							344	3440		7	HILIC						
			longissimus dorsi							351	3510		8	HILIC						
			gluteus medius							324	3240		6	HILIC						
			trapezius							298	2980		5	HILIC						
			masseter							247	2470		3	HILIC						
3	pork	raw muscle	semimembranous							346	3460		4	HILIC		J. Agric. Food Chem	2008	56, 11279-11284	Mora	
			semimembranous		cooking until 72 °C core temp	85 °C	?			222	2220		90	HILIC						
		raw muscle	biceps femoris							349	3490		5	HILIC						
			biceps femoris		cooking until 72 °C core temp	85 °C	?			193	1930		82	HILIC						
		raw muscle	gluteus							360	3600		6	HILIC						
			gluteus		cooking until 72 °C core temp	85 °C	?			217	2170		103	HILIC						
		cooked ham, most expensive top-quality		commercial						181	1810		75	HILIC						
		cooked ham, cheapest top-quality		commercial						204	2040		56	HILIC						
		cooked ham, tinned		commercial						240	2400		67	HILIC						
		cooked ham, cooked in its juice		commercial						196	1960		78	HILIC						
		cooked ham, cold-cut sandwich shoulder		commercial						134	1340		31	HILIC						
4	cod (Gadus morhua)	filet						3632	36320					HPLC	taurine, glycine, alanine	J.Food Comp. Anal.	2007	20, 396-402	Larsen	
	cod (Gadus morhua)	filet			brined	RT	30 min	3068	30680					HPLC	taurine, glycine, alanine					
	cod (Gadus morhua)	filet			boiled	90 °C	10 min	2749	27490					HPLC	taurine, glycine, alanine					
	cod (Gadus morhua)	filet			brined and boiled			2466	24660					HPLC	taurine, glycine, alanine					
	cod (Gadus morhua)	filet			baked	175 °C	20 min	2818	28180					HPLC	taurine, glycine, alanine					
	cod (Gadus morhua)	filet			brined and baked			2768	27680					HPLC	taurine, glycine, alanine					
	cod (Gadus morhua)	filet			fried	?	20 min	2547	25470					HPLC	taurine, glycine, alanine					
	cod (Gadus morhua)	filet			brined and fried			2662	26620					HPLC	taurine, glycine, alanine					
5	emu (Dromaius novaehollandiae)	raw muscle	leg and thigh					2931	29310	695	6950	24	6	HPLC	vitamins, minerals, protein, fat, carbohydrate	Food Chem.	2006	97, 193-202	Pegg	Zubereitung einer Masse zur Herstellung von Trockenfleisch
		batter						2247	22470			19		HPLC	vitamins, minerals, protein, fat, carbohydrate					
		jerky						2281	22810			12		HPLC	vitamins, minerals, protein, fat, carbohydrate					
	beef	raw muscle	semimembranous					3037	30370	786	7860	90	23	HPLC	vitamins, minerals, protein, fat, carbohydrate					
		batter						2455	24550			66		HPLC	vitamins, minerals, protein, fat, carbohydrate					
		jerky						2166	21660			17		HPLC	vitamins, minerals, protein, fat, carbohydrate					
6	beef	raw muscle	longissimus lumborum							383	3830		6	enzyme based, spectrophotometric	taurine, carnosine, Q10	Meat Science	2006	74, 443-449	Purchas	
			longissimus lumborum		cooking	200 °C external, 71 °C internal				310	3100		43	enzyme based, spectrophotometric	taurine, carnosine, Q10					

entry	species	food	muscle type	source	treatment	temperature	time	Creatine	Creatine	Creatine	Creatine	Creatinine	Creatinine	analytical method	further parameters	journal	year	volume, pages	author
			longissimus lumborum		digestion at pH 2, addition of pepsin digestion at pH 7, addition of pancreatin, bile extract	37 °C	120 min 60 min			270	2700		44	enzyme based, spectrophotometric	taurine, carnosine, Q10				
7	beef	muscle	semitendinosus					1961	19610			29		enzyme based, spectrophotometric	taurine, carnosine, Q10	Meat Science	2004	68, 201-207	Purchas
					cooking	60 °C, internal Temp		1280	12800			230		enzyme based, spectrophotometric	taurine, carnosine, Q10				
					cooking	80 °C, internal Temp		1032	10320			330		enzyme based, spectrophotometric	taurine, carnosine, Q10				
8	beef	muscle	semitendinosus							401	4010		6	enzyme based, spectrophotometric	taurine, carnosine, Q10	Meat Science	2004	66, 629-637	Purchas
			cheek							263	2630		2	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			heart							298	2980		2	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			liver							16	160		0.5	enzyme based, spectrophotometric	taurine, carnosine, Q10				
	lamb	muscle	longissimus limborun							346	3460		6	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			semitendinosus							335	3350		5	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			triceps brachii							278	2780		4	enzyme based, spectrophotometric	taurine, carnosine, Q10				
	lamb	muscle	longissimus limborun							489	4890		4	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			biceps femoris							468	4680		4	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			gluteus medius							472	4720		4	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			psoas major							511	5110		4	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			quadriceps femoris							456	4560		3	enzyme based, spectrophotometric	taurine, carnosine, Q10				
			semimembranosus							464	4640		4	enzyme based, spectrophotometric	taurine, carnosine, Q10				
9	herring (Clupea harengus)	muscle								350-420			5 bis 10	photometric, Jaffe		J Sci Food Agric	1960	11, 700-705	Hughes
		muscle			cooking	115 °C	60 min			262 (367)				photometric, Jaffe					
					cooking	115 °C	120 min			258 (382)				photometric, Jaffe					
					cooking	115 °C	180 min			265 (435)				photometric, Jaffe					
					cooking	115 °C	240 min			249 (406)				photometric, Jaffe					
					cooking	115 °C	300 min			221 (342)				photometric, Jaffe					
10	Turkey										2840			enzyme based, spectrophotometric		J Food Sci	2015	80 (11), 2430-2439	Gibis
	Chicken										4820			enzyme based, spectrophotometric					
	Ostrich										2680			enzyme based, spectrophotometric					
	Beef										5300			enzyme based, spectrophotometric					
	Veal										4880			enzyme based, spectrophotometric					
	Pork										4990			enzyme based, spectrophotometric					
	Lamb										4350			enzyme based, spectrophotometric					
	Venison										4400			enzyme based, spectrophotometric					
	Wild pork										4140			enzyme based, spectrophotometric					
	Horse										3500			enzyme based, spectrophotometric					

Analytical results

Lebensmittel	Creatine [mg/kg]	Creatinine [mg/kg]	Notes	Fat [%]
Meat				
Pork, Steaks	4880	84.1		
Schwein (Musculus longissimus dorsi)	5510	97.2		
Pork, minced meat	3630	73.1		
Beef, shank	4300	43.4		
Beef, roulade	4350	173.8		
Beef, minced meat	3230	49.2		
Calf, liver	126	6.4		
chicken, breast	4380	9.9		
Turkey, breast	4180	36.6		
Fish				
Coalfish, deep-frozen	3370	5.7	Theragra chalcogramma, Wildfang, Beringsee/Golf von Alaska	
Salmon filet, fresh	5030	20.1	Salmo salar, Atlantik	
Salmon filet, deep-frozen	4880	19.4	Pazifik-Wildlachs, Onchorhynchus keta, Wildfang, Alaska, Bristol	
tuna, steaks, deep-frozen	6450	61.4	Westpazifik, FAO 71	
Pangasius filet, deep-frozen	2700	4.4	Pangasius hypothalamus, Aquakultur, Vietnam	
Sea bass, whole fish, fresh	4050	13.1	Dicentrarchus labrax, Aquakultur, Griechenland	
Canned tuna	1700	1.2	Katsuwonus pelamis, Wildfang, Eastern Central Atlantic Ocean	
herring in tomato sauce, canned	712	916	Clupea harengus, Wildfang	
Coldmeat				
Salami	3510	100.6	Pork	
Boiled ham	3280	1.2	Pork	
Calf sausage	1640	339.4		
White sausage, Bavarian	1550	48.7		
Wiener sausage	2000	76.6		
Milk				
Cow milk, UHT, 1,5%	92.7	21.4		1.5
Cow milk, UHT, 3,5%	92	22		3.5
Cow milk, ESL, 1,5%	97.3	13		1.5
Cow milk, ESL, 3,5%	94.6	13.2		3.5
Cow milk, fresh, 1,5%	77.7	12.6		1.5
Soy milk/joghurt	<0,1	<0,1		2.9
Cow milk, lactose-free	85.7	13.1	ESL Milch	1.5
Butter	14	8.2	mild gesäuert	82
Diary products				
Whey drink	71.5	16.1	Bio Fruchtmolke, Pfirsich-Maracuja	<0,1
Joghurt, natural	137.6	30.6	natur	1.5
Joghurt, natural	80.8	24.8	natur	3.9
Joghurt	64	19.6	Erdbeer	3.5
Buttermilk	90.9	15.2	natur	max. 1
Buttermilk	96.1	15.9	natur	max. 1
Cream	67.3	9.7	heat treated	30
Sour cream	75.4	13.9		10
Ice cream	80.5	11.1		
cream cheese	58.3	20.6	natur	23.5
Feta cheese	39.4	10.7		22.5
Brie, sheep	39.1	8.9		~25
Gouda	25.5	6.1		28.8
Emmentaler cheese	17.8	11		31
Gran Padano	18.9	20.4	16 Mo gereift	28
Mozarella	24.7	4.7		18.5
Miscellaneous				
Egg, chicken, raw	4.2	<1,0		
Appel	<1,0	<1,0		
Kiwi	<10	<1,0		
Cucumber	<1,0	<1,0		

FoodCode	Long descrip	Short descrip	GROUPNAME
11000000	MILK, HUMAN	Milk, human	DAIRY
11100000	MILK, NFS	Milk, NFS	DAIRY
11111000	MILK, WHOLE	Milk, whole	DAIRY
11111100	MILK, LOW SODIUM, WHOLE	Milk, low sodium, whole	DAIRY
11111150	MILK, CALCIUM FORTIFIED, WHOLE	Milk, calcium fortified, whole	DAIRY
11111160	MILK, CALCIUM FORTIFIED, LOW FAT (1%)	Milk, calcium fortified, low fat (1%)	DAIRY
11111170	MILK, CALCIUM FORTIFIED, FAT FREE (SKIM)	Milk, calcium fortified, fat free (skim)	DAIRY
11112110	MILK, REDUCED FAT (2%)	Milk, reduced fat (2%)	DAIRY
11112120	MILK, ACIDOPHILUS, LOW FAT (1%)	Milk, acidophilus, low fat (1%)	DAIRY
11112130	MILK, ACIDOPHILUS, REDUCED FAT (2%)	Milk, acidophilus, reduced fat (2%)	DAIRY
11112210	MILK, LOW FAT (1%)	Milk, low fat (1%)	DAIRY
11113000	MILK, FAT FREE (SKIM)	Milk, fat free (skim)	DAIRY
11114300	MILK, LACTOSE FREE, LOW FAT (1%)	Milk, lactose free, low fat (1%)	DAIRY
11114320	MILK, LACTOSE FREE, FAT FREE (SKIM)	Milk, lactose free, fat free (skim)	DAIRY
11114330	MILK, LACTOSE FREE, REDUCED FAT (2%)	Milk, lactose free, reduced fat (2%)	DAIRY
11114350	MILK, LACTOSE FREE, WHOLE	Milk, lactose free, whole	DAIRY
11115000	BUTTERMILK, FAT FREE (SKIM)	Buttermilk, fat free (skim)	DAIRY
11115100	BUTTERMILK, LOW FAT (1%)	Buttermilk, low fat (1%)	DAIRY
11115200	BUTTERMILK, REDUCED FAT (2%)	Buttermilk, reduced fat (2%)	DAIRY
11115300	BUTTERMILK, WHOLE	Buttermilk, whole	DAIRY
11115400	KEFIR, NS AS TO FAT CONTENT	Kefir, NS as to fat content	DAIRY
11116000	GOAT'S MILK, WHOLE	Goat's milk, whole	DAIRY
11120000	MILK, DRY, RECONSTITUTED, NS AS TO FAT CONTENT	Milk, dry, reconstituted, NS as to fat content	DAIRY
11121100	MILK, DRY, RECONSTITUTED, WHOLE	Milk, dry, reconstituted, whole	DAIRY
11121210	MILK, DRY, RECONSTITUTED, LOW FAT (1%)	Milk, dry, reconstituted, low fat (1%)	DAIRY
11121300	MILK, DRY, RECONSTITUTED, FAT FREE (SKIM)	Milk, dry, reconstituted, fat free (skim)	DAIRY
11210050	MILK, EVAPORATED, NS AS TO FAT CONTENT	Milk, evaporated, NS as to fat content	DAIRY
11211050	MILK, EVAPORATED, WHOLE	Milk, evaporated, whole	DAIRY
11211400	MILK, EVAPORATED, REDUCED FAT (2%)	Milk, evaporated, reduced fat (2%)	DAIRY
11212050	MILK, EVAPORATED, FAT FREE (SKIM)	Milk, evaporated, fat free (skim)	DAIRY
11220000	MILK, CONDENSED, SWEETENED	Milk, condensed, sweetened	DAIRY
11410000	YOGURT, NS AS TO TYPE OF MILK/FLAVOR	Yogurt, NS as to type of milk or flavor	DAIRY
11411010	YOGURT, PLAIN, NS AS TO TYPE OF MILK	Yogurt, plain, NS as to type of milk	DAIRY
11411100	YOGURT, PLAIN, WHOLE MILK	Yogurt, plain, whole milk	DAIRY
11411200	YOGURT, PLAIN, LOW FAT MILK	Yogurt, plain, low fat milk	DAIRY
11411300	YOGURT, PLAIN, NONFAT MILK	Yogurt, plain, nonfat milk	DAIRY
11411400	YOGURT, GREEK, PLAIN, WHOLE MILK	Yogurt, Greek, plain, whole milk	DAIRY
11411410	YOGURT, GREEK, PLAIN, LOW FAT	Yogurt, Greek, plain, low fat	DAIRY
11411420	YOGURT, GREEK, PLAIN, NONFAT MILK	Yogurt, Greek, plain, nonfat milk	DAIRY
11420000	YOGURT, VANILLA, NS AS TO TYPE OF MILK	Yogurt, vanilla, NS as to type of milk	DAIRY
11421000	YOGURT, VANILLA, WHOLE MILK	Yogurt, vanilla, whole milk	DAIRY
11422000	YOGURT, VANILLA, LOW FAT MILK	Yogurt, vanilla, low fat milk	DAIRY
11422100	YOGURT, VANILLA, LOW FAT MILK, LIGHT	Yogurt, vanilla, low fat milk, light	DAIRY
11423000	YOGURT, VANILLA, NONFAT MILK	Yogurt, vanilla, nonfat milk	DAIRY
11424000	YOGURT, VANILLA, NONFAT MILK, LIGHT	Yogurt, vanilla, nonfat milk, light	DAIRY
11424500	YOGURT, GREEK, VANILLA, WHOLE MILK	Yogurt, Greek, vanilla, whole milk	DAIRY
11424510	YOGURT, GREEK, VANILLA, LOW FAT	Yogurt, Greek, vanilla, low fat	DAIRY
11424520	YOGURT, GREEK, VANILLA, NONFAT	Yogurt, Greek, vanilla, nonfat	DAIRY
11425000	YOGURT, CHOCOLATE, NS AS TO TYPE OF MILK	Yogurt, chocolate, NS as to type of milk	DAIRY
11426000	YOGURT, CHOCOLATE, WHOLE MILK	Yogurt, chocolate, whole milk	DAIRY
11427000	YOGURT, CHOCOLATE, NONFAT MILK	Yogurt, chocolate, nonfat milk	DAIRY
11428000	YOGURT, GREEK, CHOCOLATE, NONFAT	Yogurt, Greek, chocolate, nonfat	DAIRY
11430000	YOGURT, FRUIT, NS AS TO TYPE OF MILK	Yogurt, fruit, NS as to type of milk	DAIRY
11431000	YOGURT, FRUIT, WHOLE MILK	Yogurt, fruit, whole milk	DAIRY
11432000	YOGURT, FRUIT, LOW FAT MILK	Yogurt, fruit, low fat milk	DAIRY
11432500	YOGURT, FRUIT, LOW FAT MILK, LIGHT	Yogurt, fruit, low fat milk, light	DAIRY
11433000	YOGURT, FRUIT, NONFAT MILK	Yogurt, fruit, nonfat milk	DAIRY
11433500	YOGURT, FRUIT, NONFAT MILK, LIGHT	Yogurt, fruit, nonfat milk, light	DAIRY
11434000	YOGURT, GREEK, FRUIT, WHOLE MILK	Yogurt, Greek, fruit, whole milk	DAIRY
11434010	YOGURT, GREEK, FRUIT, LOW FAT	Yogurt, Greek, fruit, low fat	DAIRY
11434020	YOGURT, GREEK, FRUIT, NONFAT	Yogurt, Greek, fruit, nonfat	DAIRY
11459990	YOGURT, FROZEN, NS AS TO FLAVOR, NS TO TYPE OF MILK	Yogurt, frozen, NS as to flavor, NS as to type of milk	DAIRY
11460000	YOGURT, FROZEN, NOT CHOCOLATE, TYPE OF MILK NS	Yogurt, frozen, flavors other than chocolate, NS as to type of milk	DAIRY
11460100	YOGURT, FROZEN, CHOCOLATE, TYPE OF MILK NS	Yogurt, frozen, chocolate, NS as to type of milk	DAIRY
11460150	YOGURT, FROZEN, NS AS TO FLAVOR, LOWFAT MILK	Yogurt, frozen, NS as to flavor, lowfat milk	DAIRY
11460160	YOGURT, FROZEN, CHOCOLATE, LOWFAT MILK	Yogurt, frozen, chocolate, lowfat milk	DAIRY
11460170	YOGURT, FROZEN, NOT CHOCOLATE, LOWFAT MILK	Yogurt, frozen, flavors other than chocolate, lowfat milk	DAIRY
11460190	YOGURT, FROZEN, NS AS TO FLAVOR, NONFAT MILK	Yogurt, frozen, NS as to flavor, nonfat milk	DAIRY
11460200	YOGURT, FROZEN, CHOCOLATE, NONFAT MILK	Yogurt, frozen, chocolate, nonfat milk	DAIRY
11460250	YOGURT,FROZEN,NOT CHOCOLATE,W/ SORBET/SORBET-COATED	Yogurt, frozen, flavors other than chocolate, with sorbet or sorbet-coated	DAIRY
11460300	YOGURT, FROZEN, NOT CHOCOLATE, NONFAT MILK	Yogurt, frozen, flavors other than chocolate, nonfat milk	DAIRY
11460400	YOGURT,FRZ,CHOCOLATE,NONFAT MILK,W/ LOW-CAL SWEET	Yogurt, frozen, chocolate, nonfat milk, with low-calorie sweetener	DAIRY
11460410	YOGURT,FRZ,NOT CHOC,NONFAT MILK,W/ LOW-CAL SWEET	Yogurt, frozen, flavors other than chocolate, nonfat milk, with low-calorie sweetener	DAIRY
11460420	YOGURT, FROZEN, NS AS TO FLAVOR, WHOLE MILK	Yogurt, frozen, NS as to flavor, whole milk	DAIRY
11460430	YOGURT, FROZEN, CHOCOLATE, WHOLE MILK	Yogurt, frozen, chocolate, whole milk	DAIRY
11460440	YOGURT, FROZEN, NOT CHOCOLATE, WHOLE MILK	Yogurt, frozen, flavors other than chocolate, whole milk	DAIRY
11461000	YOGURT, FROZEN, CHOCOLATE-COATED	Yogurt, frozen, chocolate-coated	DAIRY
11461200	YOGURT, FROZEN, SANDWICH	Yogurt, frozen, sandwich	DAIRY
11461250	YOGURT, FROZEN, CONE, CHOCOLATE	Yogurt, frozen, cone, chocolate	DAIRY
11461260	YOGURT, FROZEN, CONE, NOT CHOCOLATE	Yogurt, frozen, cone, flavors other than chocolate	DAIRY
11461270	YOGURT, FROZEN, CONE, NOT CHOCOLATE, LOWFAT MILK	Yogurt, frozen, cone, flavors other than chocolate, lowfat milk	DAIRY
11461280	YOGURT, FROZ, CONE, CHOCOLATE, LOWFAT MILK	Yogurt, frozen, cone, chocolate, lowfat milk	DAIRY
11480010	YOGURT, WHOLE MILK, BF	Yogurt, whole milk, baby food	DAIRY
11480020	YOGURT, WHOLE MILK, BF, W/FRUIT& MULTIGRAIN CEREAL,NFS	Yogurt, whole milk, baby food, with fruit and multigrain cereal puree, NFS	DAIRY
11480030	YOGURT, WHOLE MILK, BF, W/FRUIT&MULTIGRAIN CEREAL + IRON	Yogurt, whole milk, baby food, with fruit and multigrain cereal puree, plus iron	DAIRY
11480040	YOGURT, WHOLE MILK, BF, W/FRUIT&MULTIGRAIN CEREAL + DHA	Yogurt, whole milk, baby food, with fruit and multigrain cereal puree, plus DHA	DAIRY
11511000	CHOCOLATE MILK, NFS	Chocolate milk, NFS	DAIRY
11511100	CHOCOLATE MILK, READY TO DRINK, WHOLE	Chocolate milk, ready to drink, whole	DAIRY
11511200	CHOCOLATE MILK, READY TO DRINK, REDUCED FAT (2%)	Chocolate milk, ready to drink, reduced fat (2%)	DAIRY
11511300	CHOCOLATE MILK, READY TO DRINK, FAT FREE (SKIM)	Chocolate milk, ready to drink, fat free (skim)	DAIRY
11511400	CHOCOLATE MILK, READY TO DRINK, LOW FAT (1%)	Chocolate milk, ready to drink, low fat (1%)	DAIRY
11511550	CHOCOLATE MILK, READY TO DRINK, REDUCED SUGAR, NS AS TO MILK	Chocolate milk, ready to drink, reduced sugar, NS as to milk	DAIRY
11511600	NESQUIK, CHOCOLATE MILK, READY TO DRINK, LOW FAT (1%)	Nesquik, chocolate milk, ready to drink, low fat (1%)	DAIRY
11511610	NESQUIK, CHOCOLATE MILK, READY TO DRINK, FAT FREE (SKIM)	Nesquik, chocolate milk, ready to drink, fat free (skim)	DAIRY
11511700	NESQUIK, CHOC MILK, READY TO DRINK, LOW FAT (1%), NO SUG ADD	Nesquik, chocolate milk, ready to drink, low fat (1%), no sugar added	DAIRY
11512010	HOT CHOCOLATE / COCOA, READY TO DRINK	Hot chocolate / Cocoa, ready to drink	DAIRY
11512020	HOT CHOCOLATE / COCOA, READY TO DRINK, MADE WITH NONFAT MILK	Hot chocolate / Cocoa, ready to drink, made with nonfat milk	DAIRY
11512030	HOT CHOCO / COCOA, READY TO DRINK, MADE WITH NON-DAIRY MILK	Hot chocolate / Cocoa, ready to drink, made with non-dairy milk	DAIRY
11512100	HOT CHOCOLATE / COCOA, READY TO DRINK, WITH WHIPPED CREAM	Hot chocolate / Cocoa, ready to drink, with whipped cream	DAIRY
11512110	HOT CHOC, READY TO DRINK, MADE W/ NONFAT MILK & WHIP CREAM	Hot chocolate / Cocoa, ready to drink, made with nonfat milk and whipped cream	DAIRY
11512120	HOT CHOCO, READY TO DRINK, MADE W/ NODAIRY MILK & WHIP CREAM	Hot chocolate / Cocoa, ready to drink, made with non-dairy milk and whipped cream	DAIRY
11513000	CHOCOLATE MILK, MADE FROM DRY MIX, NS AS TO TYPE OF MILK	Chocolate milk, made from dry mix, NS as to type of milk	DAIRY
11513100	CHOCOLATE MILK, MADE FROM DRY MIX WITH WHOLE MILK	Chocolate milk, made from dry mix with whole milk	DAIRY
11513150	CHOCOLATE MILK, MADE FROM DRY MIX WITH REDUCED FAT MILK (2%)	Chocolate milk, made from dry mix with reduced fat milk (2%)	DAIRY
11513200	CHOCOLATE MILK, MADE FROM DRY MIX WITH LOW FAT MILK (1%)	Chocolate milk, made from dry mix with low fat milk (1%)	DAIRY
11513300	CHOCOLATE MILK, MADE FROM DRY MIX WITH FAT FREE MILK (SKIM)	Chocolate milk, made from dry mix with fat free milk (skim)	DAIRY
11513310	CHOCOLATE MILK, MADE FROM DRY MIX WITH NON-DAIRY MILK	Chocolate milk, made from dry mix with non-dairy milk	DAIRY
11513350	CHOC MILK, MADE FROM REDUCED SUGAR MIX, NS AS TO TYPE OF MIL	Chocolate milk, made from reduced sugar mix, NS as to type of milk	DAIRY
11513355	CHOCOLATE MILK, MADE FROM REDUCED SUGAR MIX WITH WHOLE MILK	Chocolate milk, made from reduced sugar mix with whole milk	DAIRY
11513360	CHOC MILK, MADE FROM RED SUGAR MIX WITH RED FAT MILK (2%)	Chocolate milk, made from reduced sugar mix with reduced fat milk (2%)	DAIRY
11513365	CHOC MILK, MADE FROM RED SUGAR MIX WITH LOW FAT MILK (1%)	Chocolate milk, made from reduced sugar mix with low fat milk (1%)	DAIRY
11513370	CHOC MILK, MADE FROM RED SUGAR MIX WITH FAT FREE MILK (SKIM)	Chocolate milk, made from reduced sugar mix with fat free milk (skim)	DAIRY
11513375	CHOC MILK, MADE FROM REDUCED SUGAR MIX WITH NON-DAIRY MILK	Chocolate milk, made from reduced sugar mix with non-dairy milk	DAIRY
11513380	NESQUIK, CHOC MILK, MADE FROM DRY MIX, NS AS TO TYPE OF MILK	Nesquik, chocolate milk, made from dry mix, NS as to type of milk	DAIRY
11513381	NESQUIK, CHOCOLATE MILK, MADE FROM DRY MIX WITH WHOLE MILK	Nesquik, chocolate milk, made from dry mix with whole milk	DAIRY
11513382	NESQUIK, CHOC MILK, MADE FROM DRY MIX WITH REDUCED FAT MILK	Nesquik, chocolate milk, made from dry mix with reduced fat milk (2%)	DAIRY

FoodCode	Long descrip	Short descrip	GROUPNAME
11513383	NESQUIK, CHOCOLATE MILK, MADE FROM DRY MIX WITH LOW FAT MILK	Nesquik, chocolate milk, made from dry mix with low fat milk (1%)	DAIRY
11513384	NESQUIK, CHOC MILK, MADE FROM DRY MIX WITH FAT FREE MILK	Nesquik, chocolate milk, made from dry mix with fat free milk (skim)	DAIRY
11513385	NESQUIK, CHOC MILK, MADE FROM DRY MIX WITH NON-DAIRY MILK	Nesquik, chocolate milk, made from dry mix with non-dairy milk	DAIRY
11513390	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX, NS AS TO MILK	Nesquik, chocolate milk, made from no sugar added dry mix, NS as to type of milk	DAIRY
11513391	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ WHOLE MILK	Nesquik, chocolate milk, made from no sugar added dry mix with whole milk	DAIRY
11513392	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ RED FAT MILK	Nesquik, chocolate milk, made from no sugar added dry mix with reduced fat milk (2%	DAIRY
11513393	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ LOW FAT MILK	Nesquik, chocolate milk, made from no sugar added dry mix with low fat milk (1%)	DAIRY
11513394	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ FAT FREE MILK	Nesquik, chocolate milk, made from no sugar added dry mix with fat free milk (skim)	DAIRY
11513395	NESQUIK, CHOC MILK, NO SUGAR ADDED DRY MIX W/ NON-DAIRY MILK	Nesquik, chocolate milk, made from no sugar added dry mix with non-dairy milk	DAIRY
11513400	CHOCOLATE MILK, MADE FROM SYRUP, NS AS TO TYPE OF MILK	Chocolate milk, made from syrup, NS as to type of milk	DAIRY
11513500	CHOCOLATE MILK, MADE FROM SYRUP WITH WHOLE MILK	Chocolate milk, made from syrup with whole milk	DAIRY
11513550	CHOCOLATE MILK, MADE FROM SYRUP WITH REDUCED FAT MILK (2%)	Chocolate milk, made from syrup with reduced fat milk (2%)	DAIRY
11513600	CHOCOLATE MILK, MADE FROM SYRUP WITH LOW FAT MILK (1%)	Chocolate milk, made from syrup with low fat milk (1%)	DAIRY
11513700	CHOCOLATE MILK, MADE FROM SYRUP WITH FAT FREE MILK (SKIM)	Chocolate milk, made from syrup with fat free milk (skim)	DAIRY
11513750	CHOCOLATE MILK, MADE FROM SYRUP WITH NON-DAIRY MILK	Chocolate milk, made from syrup with non-dairy milk	DAIRY
11513800	CHOCOLATE MILK, MADE FROM LIGHT SYRUP, NS AS TO TYPE OF MILK	Chocolate milk, made from light syrup, NS as to type of milk	DAIRY
11513801	CHOCOLATE MILK, MADE FROM LIGHT SYRUP WITH WHOLE MILK	Chocolate milk, made from light syrup with whole milk	DAIRY
11513802	CHOCOLATE MILK, MADE FROM LIGHT SYRUP WITH REDUCED FAT MILK	Chocolate milk, made from light syrup with reduced fat milk (2%)	DAIRY
11513803	CHOCOLATE MILK, MADE FROM LIGHT SYRUP WITH LOW FAT MILK (1%)	Chocolate milk, made from light syrup with low fat milk (1%)	DAIRY
11513804	CHOC MILK, MADE FROM LIGHT SYRUP WITH FAT FREE MILK (SKIM)	Chocolate milk, made from light syrup with fat free milk (skim)	DAIRY
11513805	CHOCOLATE MILK, MADE FROM LIGHT SYRUP WITH NON-DAIRY MILK	Chocolate milk, made from light syrup with non-dairy milk	DAIRY
11513850	CHOC MILK, MADE FROM SUGAR FREE SYRUP, NS AS TO TYPE OF MILK	Chocolate milk, made from sugar free syrup, NS as to type of milk	DAIRY
11513851	CHOCOLATE MILK, MADE FROM SUGAR FREE SYRUP WITH WHOLE MILK	Chocolate milk, made from sugar free syrup with whole milk	DAIRY
11513852	CHOC MILK, FROM SUGAR FREE SYRUP WITH REDUCED FAT MILK	Chocolate milk, made from sugar free syrup with reduced fat milk (2%)	DAIRY
11513853	CHOCOLATE MILK, MADE FROM SUGAR FREE SYRUP WITH LOW FAT MILK	Chocolate milk, made from sugar free syrup with low fat milk (1%)	DAIRY
11513854	CHOC MILK, MADE FROM SUGAR FREE SYRUP WITH FAT FREE MILK	Chocolate milk, made from sugar free syrup with fat free milk (skim)	DAIRY
11513855	CHOC MILK, MADE FROM SUGAR FREE SYRUP WITH NON-DAIRY MILK	Chocolate milk, made from sugar free syrup with non-dairy milk	DAIRY
11514100	HOT CHOCOLATE / COCOA, MADE WITH DRY MIX AND WATER	Hot chocolate / Cocoa, made with dry mix and water	DAIRY
11514110	HOT CHOCOLATE / COCOA, MADE WITH DRY MIX AND WHOLE MILK	Hot chocolate / Cocoa, made with dry mix and whole milk	DAIRY
11514120	HOT CHOCO, MADE WITH DRY MIX AND REDUCED FAT MILK (2%)	Hot chocolate / Cocoa, made with dry mix and reduced fat milk (2%)	DAIRY
11514130	HOT CHOC, MADE WITH DRY MIX AND LOW FAT MILK (1%)	Hot chocolate / Cocoa, made with dry mix and low fat milk (1%)	DAIRY
11514140	HOT CHOC, MADE WITH DRY MIX AND FAT FREE MILK (SKIM)	Hot chocolate / Cocoa, made with dry mix and fat free milk (skim)	DAIRY
11514150	HOT CHOCOLATE / COCOA, MADE WITH DRY MIX AND NON-DAIRY MILK	Hot chocolate / Cocoa, made with dry mix and non-dairy milk	DAIRY
11514310	HOT CHOC MADE WITH NO SUGAR ADDED DRY MIX AND WATER	Hot chocolate / Cocoa, made with no sugar added dry mix and water	DAIRY
11514320	HOT CHOC, MADE W/ NO SUGAR ADDED DRY MIX AND WHOLE MILK	Hot chocolate / Cocoa, made with no sugar added dry mix and whole milk	DAIRY
11514330	HOT CHOC, MADE W/ NO SUG ADDED DRY MIX & REDUC FAT MILK (2%)	Hot chocolate / Cocoa, made with no sugar added dry mix and reduced fat milk (2%)	DAIRY
11514340	HOT CHOC, MADE W/ NO SUGAR ADDED DRY MIX & LOW FAT MILK (%)	Hot chocolate / Cocoa, made with no sugar added dry mix and low fat milk (1%)	DAIRY
11514350	HOT CHOC, MADE W/ NO SUG ADDED DRY MIX & FAT FRE MILK (SKIM)	Hot chocolate / Cocoa, made with no sugar added dry mix and fat free milk (skim)	DAIRY
11514360	HOT CHOC, MADE W/ NO SUGAR ADDED DRY MIX AND NON-DAIRY MILK	Hot chocolate / Cocoa, made with no sugar added dry mix and non-dairy milk	DAIRY
11519040	STRAWBERRY MILK, NFS	Strawberry milk, NFS	DAIRY
11519050	STRAWBERRY MILK, WHOLE	Strawberry milk, whole	DAIRY
11519105	STRAWBERRY MILK, REDUCED FAT (2%)	Strawberry milk, reduced fat (2%)	DAIRY
11519200	STRAWBERRY MILK, LOW FAT (1%)	Strawberry milk, low fat (1%)	DAIRY
11519205	STRAWBERRY MILK, FAT FREE (SKIM)	Strawberry milk, fat free (skim)	DAIRY
11519215	STRAWBERRY MILK, NON-DAIRY	Strawberry milk, non-dairy	DAIRY
11525000	MILK, MALTED, NATURAL FLAVOR, MADE WITH MILK	Milk, malted, natural flavor, made with milk	DAIRY
11526000	MILK, MALTED, CHOCOLATE, MADE WITH MILK	Milk, malted, chocolate, made with milk	DAIRY
11541110	MILK SHAKE, HOME RECIPE, CHOCOLATE	Milk shake, home recipe, chocolate	DAIRY
11541120	MILK SHAKE, HOME RECIPE, FLAVORS OTHER THAN CHOCOLATE	Milk shake, home recipe, flavors other than chocolate	DAIRY
11541130	MILK SHAKE, HOME RECIPE, CHOCOLATE, LIGHT	Milk shake, home recipe, chocolate, light	DAIRY
11541135	MILK SHAKE, HOME RECIPE, FLAVORS OTHER THAN CHOCOLATE, LIGHT	Milk shake, home recipe, flavors other than chocolate, light	DAIRY
11541400	MILK SHAKE WITH MALT (INCL MALTED MILK W/ICE CREAM)	Milk shake with malt	DAIRY
11542100	MILK SHAKE, FAST FOOD, CHOCOLATE	Milk shake, fast food, chocolate	DAIRY
11542200	MILK SHAKE, FAST FOOD, FLAVORS OTHER THAN CHOCOLATE	Milk shake, fast food, flavors other than chocolate	DAIRY
11543000	MILK SHAKE, BOTTLED, CHOCOLATE	Milk shake, bottled, chocolate	DAIRY
11543010	MILK SHAKE, BOTTLED, FLAVORS OTHER THAN CHOCOLATE	Milk shake, bottled, flavors other than chocolate	DAIRY
12100100	CREAM, FLUID, NS AS TO LIGHT, HEAVY OR HALF & HALF	Cream, NS as to light, heavy, or half and half	DAIRY
12110100	CREAM, LIGHT, FLUID (INCL COFFEE CRM, TABLE CREAM)	Cream, light, fluid	DAIRY
12110300	CREAM, LIGHT, WHIPPED, UNSWEETENED	Cream, light, whipped, unsweetened	DAIRY
12120100	CREAM, HALF & HALF	Cream, half and half	DAIRY
12120105	CREAM, HALF & HALF, LOW FAT	Cream, half and half, low fat	DAIRY
12120110	CREAM, HALF & HALF, FAT FREE	Cream, half and half, fat free	DAIRY
12130100	CREAM, HEAVY, FLUID	Cream, heavy, fluid	DAIRY
12130200	CREAM, HEAVY, WHIPPED, UNSWEETENED	Cream, heavy, whipped, unsweetened	DAIRY
12140000	CREAM, HEAVY, WHIPPED, SWEETENED	Cream, heavy, whipped, sweetened	DAIRY
12140100	CREAM, WHIPPED, PRESSURIZED CONTAINER	Cream, whipped, pressurized container	DAIRY
12140105	CREAM, WHIPPED, PRESSURIZED CONTAINER, LIGHT	Cream, whipped, pressurized container, light	DAIRY
12140110	WHIPPED TOPPING, DAIRY BASED, FAT FREE, PRESSURIZED CONTAINR	Whipped topping, dairy based, fat free, pressurized container	DAIRY
12310100	SOUR CREAM (INCL W/ CHIVES)	Sour cream	DAIRY
12310200	SOUR CREAM, HALF & HALF	Sour cream, half and half	DAIRY
12310300	SOUR CREAM, REDUCED FAT	Sour cream, reduced fat	DAIRY
12310350	SOUR CREAM, LIGHT	Sour cream, light	DAIRY
12310370	SOUR CREAM, FAT FREE	Sour cream, fat free	DAIRY
12320100	SOUR CREAM, IMITATION	Sour cream, imitation (nondairy)	DAIRY
12320200	SOUR CREAM, FILLED, SOUR DRESSING, NONBUTTERFAT	Sour cream, filled, sour dressing, nonbutterfat	DAIRY
14010000	CHEESE, NFS	Cheese, NFS	DAIRY
14101010	CHEESE, BLUE OR ROQUEFORT	Cheese, Blue or Roquefort	DAIRY
14102010	CHEESE, BRICK	Cheese, Brick	DAIRY
14103010	CHEESE, CAMEMBERT	Cheese, Camembert	DAIRY
14103020	CHEESE, BRIE	Cheese, Brie	DAIRY
14104100	CHEESE, CHEDDAR	Cheese, Cheddar	DAIRY
14104110	CHEESE, CHEDDAR, REDUCED FAT	Cheese, Cheddar, reduced fat	DAIRY
14104115	CHEESE, CHEDDAR, NONFAT OR FAT FREE	Cheese, Cheddar, nonfat or fat free	DAIRY
14104200	CHEESE, COLBY	Cheese, Colby	DAIRY
14104250	CHEESE, COLBY JACK	Cheese, Colby Jack	DAIRY
14104400	CHEESE, FETA (INCLUDE GOAT CHEESE)	Cheese, Feta	DAIRY
14104600	CHEESE, FONTINA	Cheese, Fontina	DAIRY
14104700	CHEESE, GOAT	Cheese, goat	DAIRY
14105010	CHEESE, GOUDA OR EDAM	Cheese, Gouda or Edam	DAIRY
14105200	CHEESE, GRUYERE	Cheese, Gruyere	DAIRY
14106010	CHEESE, LIMBURGER	Cheese, Limburger	DAIRY
14106200	CHEESE, MONTEREY	Cheese, Monterey	DAIRY
14106500	CHEESE, MONTEREY, REDUCED FAT	Cheese, Monterey, reduced fat	DAIRY
14107010	CHEESE, MOZZARELLA, NFS (INCLUDE PIZZA CHEESE)	Cheese, Mozzarella, NFS	DAIRY
14107020	CHEESE, MOZZARELLA, WHOLE MILK	Cheese, Mozzarella, whole milk	DAIRY
14107030	CHEESE, MOZZARELLA, PART SKIM (INCL "LOWFAT")	Cheese, Mozzarella, part skim	DAIRY
14107040	CHEESE, MOZZARELLA, REDUCED SODIUM	Cheese, Mozzarella, reduced sodium	DAIRY
14107060	CHEESE, MOZZARELLA, NONFAT OR FAT FREE	Cheese, Mozzarella, nonfat or fat free	DAIRY
14107200	CHEESE, MUENSTER	Cheese, Muenster	DAIRY
14107250	CHEESE, MUENSTER, REDUCED FAT	Cheese, Muenster, reduced fat	DAIRY
14108010	CHEESE, PARMESAN, DRY, GRATED (INCLUDE ROMANO)	Cheese, Parmesan, dry grated	DAIRY
14108015	CHEESE, PARMESAN, DRY GRATED, REDUCED FAT	Cheese, Parmesan, dry grated, reduced fat	DAIRY
14108020	CHEESE, PARMESAN, HARD (INCLUDE ROMANO)	Cheese, Parmesan, hard	DAIRY
14108060	CHEESE, PARMESAN, DRY GRATED, FAT FREE	Cheese, Parmesan, dry grated, fat free	DAIRY
14108200	CHEESE, PORT DU SALUT	Cheese, Port du Salut	DAIRY
14108400	CHEESE, PROVOLONE	Cheese, Provolone	DAIRY
14108420	CHEESE, PROVOLONE, REDUCED FAT	Cheese, provolone, reduced fat	DAIRY
14109010	CHEESE, SWISS	Cheese, Swiss	DAIRY
14109020	CHEESE, SWISS, REDUCED SODIUM	Cheese, Swiss, reduced sodium	DAIRY
14109030	CHEESE, SWISS, REDUCED FAT	Cheese, Swiss, reduced fat	DAIRY
14109040	CHEESE, SWISS, NONFAT OR FAT FREE	Cheese, Swiss, nonfat or fat free	DAIRY
14110010	CHEESE, CHEDDAR, REDUCED SODIUM	Cheese, Cheddar, reduced sodium	DAIRY
14120010	CHEESE, MEXICAN BLEND	Cheese, Mexican blend	DAIRY
14120020	CHEESE, MEXICAN BLEND, REDUCED FAT	Cheese, Mexican blend, reduced fat	DAIRY
14131000	QUESO ANEJO (AGED MEXICAN CHEESE)	Queso Anejo (aged Mexican cheese)	DAIRY
14131500	QUESO ASADERO (INCL OAXACAN-STYLE STRING CHEESE)	Queso Asadero	DAIRY

FoodCode	Long descrip	Short descrip	GROUPNAME
14132000	QUESO CHIHUAHUA (INCL MENNONITE CHEESE)	Queso Chihuahua	DAIRY
14133000	QUESO FRESCO (HISPANIC-STYLE FARMER CHEESE)	Queso Fresco	DAIRY
14134000	QUESO COTIJA	Queso cotija	DAIRY
14200100	CHEESE, COTTAGE, NFS	Cheese, cottage, NFS	DAIRY
14201010	CHEESE, COTTAGE, CREAMED	Cheese, cottage, creamed, large or small curd	DAIRY
14201200	COTTAGE CHEESE, FARMER'S	Cottage cheese, farmer's	DAIRY
14201500	CHEESE, RICOTTA	Cheese, Ricotta	DAIRY
14202010	CHEESE, COTTAGE, W/ FRUIT	Cheese, cottage, with fruit	DAIRY
14202020	CHEESE, COTTAGE, W/ VEGETABLES	Cheese, cottage, with vegetables	DAIRY
14203010	CHEESE, COTTAGE, DRY CURD	Cheese, cottage, dry curd	DAIRY
14203020	CHEESE, COTTAGE, SALTED, DRY CURD	Cheese, cottage, salted, dry curd	DAIRY
14203510	P.R. WHITE CHEESE (QUESO DEL PAIS, BLANCO)	Puerto Rican white cheese (queso del pais, blanco)	DAIRY
14204010	CHEESE, COTTAGE, LOWFAT	Cheese, cottage, lowfat (1-2% fat)	DAIRY
14204020	CHEESE, COTTAGE, LOWFAT, W/ FRUIT	Cheese, cottage, lowfat, with fruit	DAIRY
14204030	CHEESE, COTTAGE, LOWFAT, W/ VEGETABLES	Cheese, cottage, lowfat, with vegetables	DAIRY
14206010	CHEESE, COTTAGE, LOWFAT, LOW SODIUM	Cheese, cottage, lowfat, low sodium	DAIRY
14207010	CHEESE, COTTAGE, LOWFAT, LACTOSE REDUCED	Cheese, cottage, lowfat, lactose reduced	DAIRY
14301010	CHEESE, CREAM	Cheese, cream	DAIRY
14303010	CHEESE, CREAM, LIGHT/LITE (FORMERLY CALLED CR CHEESE LOWFAT)	Cheese, cream, light or lite (formerly called Cream Cheese Lowfat)	DAIRY
14410100	CHEESE, AMERICAN AND SWISS BLENDS	Cheese, American and Swiss blends	DAIRY
14410110	CHEESE, AMERICAN	Cheese, American	DAIRY
14410120	CHEESE, AMERICAN, REDUCED FAT	Cheese, American, reduced fat	DAIRY
14410130	CHEESE, AMERICAN, NONFAT OR FAT FREE	Cheese, American, nonfat or fat free	DAIRY
14410210	CHEESE, AMERICAN, REDUCED SODIUM	Cheese, American, reduced sodium	DAIRY
14410330	CHEESE SPREAD, AMERICAN OR CHEDDAR CHEESE BASE, REDUCED FAT	Cheese spread, American or Cheddar cheese base, reduced fat	DAIRY
14410380	CHEESE, PROCESSED CREAM CHEESE PRODUCT, NONFAT	Cheese, processed cream cheese product, nonfat or fat free	DAIRY
14410500	CHEESE, PROCESSED, CHEESE FOOD	Cheese, processed cheese food	DAIRY
14410600	CHEESE, PROCESSED, W/VEGETABLES(INCL PEPPER CHEESE)	Cheese, processed, with vegetables	DAIRY
14410620	CHEESE, WITH WINE	Cheese, with wine	DAIRY
14420100	CHEESE SPREAD, AMERICAN OR CHEDDAR CHEESE BASE	Cheese spread, American or Cheddar cheese base	DAIRY
14420160	CHEESE SPREAD, SWISS CHEESE BASE	Cheese spread, Swiss cheese base	DAIRY
14420200	CHEESE SPRD, CREAM CHEESE, REG	Cheese spread, cream cheese, regular	DAIRY
14420210	CHEESE SPREAD, CREAM CHEESE, LIGHT OR LITE	Cheese spread, cream cheese, light or lite	DAIRY
14420300	CHEESE SPREAD, PRESSURIZED CAN	Cheese spread, pressurized can	DAIRY
14502000	IMITATION CHEESE	Imitation cheese	DAIRY
14610200	COTTAGE CHEESE, W/ GELATIN DESSERT	Cheese, cottage cheese, with gelatin dessert	DAIRY
14610210	COTTAGE CHEESE, W/ GELATIN DESSERT & FRUIT	Cheese, cottage cheese, with gelatin dessert and fruit	DAIRY
14610250	COTTAGE CHEESE W/ GELATIN DESSERT & VEGETABLES	Cheese, cottage cheese, with gelatin dessert and vegetables	DAIRY
21000100	BEEF, NS AS TO CUT, COOKED, NS AS TO FAT	Beef, NS as to cut, cooked, NS as to fat eaten	BEEF
21000110	BEEF, NS AS TO CUT, COOKED, LEAN & FAT	Beef, NS as to cut, cooked, lean and fat eaten	BEEF
21000120	BEEF, NS AS TO CUT, COOKED, LEAN ONLY	Beef, NS as to cut, cooked, lean only eaten	BEEF
21001000	STEAK, NS AS TO TYPE OF MEAT, COOKED, NS AS TO FAT	Steak, NS as to type of meat, cooked, NS as to fat eaten	BEEF
21001010	STEAK, NS AS TO TYPE OF MEAT, COOKED, LEAN & FAT	Steak, NS as to type of meat, cooked, lean and fat eaten	BEEF
21001020	STEAK, NS AS TO TYPE OF MEAT, COOKED, LEAN ONLY	Steak, NS as to type of meat, cooked, lean only eaten	BEEF
21002000	BEEF, PICKLED	Beef, pickled	BEEF
21003000	BEEF, NS AS TO CUT, FRIED, NS AS TO FAT EATEN	Beef, NS as to cut, fried, NS to fat eaten	BEEF
21101000	BEEF STEAK, NS AS TO COOKING METHOD, NS AS TO FAT	Beef steak, NS as to cooking method, NS as to fat eaten	BEEF
21101010	BEEF STEAK, NS AS TO COOKING METHOD, LEAN & FAT	Beef steak, NS as to cooking method, lean and fat eaten	BEEF
21101020	BEEF STEAK, NS AS TO COOKING METHOD, LEAN ONLY	Beef steak, NS as to cooking method, lean only eaten	BEEF
21101110	BEEF STEAK, BROILED OR BAKED, NS AS TO FAT	Beef steak, broiled or baked, NS as to fat eaten	BEEF
21101120	BEEF STEAK, BROILED OR BAKED, LEAN & FAT	Beef steak, broiled or baked, lean and fat eaten	BEEF
21101130	BEEF STEAK, BROILED OR BAKED, LEAN ONLY	Beef steak, broiled or baked, lean only eaten	BEEF
21102110	BEEF STEAK, FRIED, NS AS TO FAT	Beef steak, fried, NS as to fat eaten	BEEF
21102120	BEEF STEAK, FRIED, LEAN & FAT	Beef steak, fried, lean and fat eaten	BEEF
21102130	BEEF STEAK, FRIED, LEAN ONLY	Beef steak, fried, lean only eaten	BEEF
21103110	BEEF STEAK,BREADED/FLOURED,BAKED/FRIED,NS AS TO FAT	Beef steak, breaded or floured, baked or fried, NS as to fat eaten	BEEF
21103120	BEEF STEAK, BREADED/FLOURED,BAKED/FRIED, LEAN & FAT	Beef steak, breaded or floured, baked or fried, lean and fat eaten	BEEF
21103130	BEEF STEAK, BREADED/FLOURED, BAKED/FRIED, LEAN ONLY	Beef steak, breaded or floured, baked or fried, lean only eaten	BEEF
21104110	BEEF STEAK, BATTERED, FRIED, NS AS TO FAT	Beef steak, battered, fried, NS as to fat eaten	BEEF
21104120	BEEF STEAK, BATTERED, FRIED, LEAN & FAT	Beef steak, battered, fried, lean and fat eaten	BEEF
21104130	BEEF STEAK, BATTERED, FRIED, LEAN ONLY	Beef steak, battered, fried, lean only eaten	BEEF
21105110	BEEF STEAK, BRAISED, NS AS TO FAT	Beef steak, braised, NS as to fat eaten	BEEF
21105120	BEEF STEAK, BRAISED, LEAN & FAT	Beef steak, braised, lean and fat eaten	BEEF
21105130	BEEF STEAK, BRAISED, LEAN ONLY	Beef steak, braised, lean only eaten	BEEF
21301000	BEEF, OXTAILS, COOKED	Beef, oxtails, cooked	BEEF
21302000	BEEF, NECK BONES, COOKED	Beef, neck bones, cooked	BEEF
21304000	BEEF, SHORTRIBS, COOKED, NS AS TO FAT	Beef, shortribs, cooked, NS as to fat eaten	BEEF
21304110	BEEF, SHORTRIBS, COOKED, LEAN & FAT	Beef, shortribs, cooked, lean and fat eaten	BEEF
21304120	BEEF, SHORTRIBS, COOKED, LEAN ONLY	Beef, shortribs, cooked, lean only eaten	BEEF
21304200	BEEF, SHORTRIBS, BBQ, W/ SAUCE, NS AS TO FAT	Beef, shortribs, barbecued, with sauce, NS as to fat eaten	BEEF
21304210	BEEF, SHORTRIBS, BBQ, W/ SAUCE, LEAN & FAT	Beef, shortribs, barbecued, with sauce, lean and fat eaten	BEEF
21304220	BEEF, SHORTRIBS, BBQ, W/ SAUCE, LEAN ONLY	Beef, shortribs, barbecued, with sauce, lean only eaten	BEEF
21305000	BEEF, COW HEAD, COOKED	Beef, cow head, cooked	BEEF
21401000	BEEF, ROAST, ROASTED, NS AS TO FAT	Beef, roast, roasted, NS as to fat eaten	BEEF
21401110	BEEF, ROAST, ROASTED, LEAN & FAT	Beef, roast, roasted, lean and fat eaten	BEEF
21401120	BEEF, ROAST, ROASTED, LEAN ONLY	Beef, roast, roasted, lean only eaten	BEEF
21401400	BEEF, ROAST, CANNED	Beef, roast, canned	BEEF
21407000	BEEF, POT ROAST, BRAISED OR BOILED, NS AS TO FAT	Beef, pot roast, braised or boiled, NS as to fat eaten	BEEF
21407110	BEEF, POT ROAST, BRAISED OR BOILED, LEAN & FAT	Beef, pot roast, braised or boiled, lean and fat eaten	BEEF
21407120	BEEF, POT ROAST, BRAISED OR BOILED, LEAN ONLY	Beef, pot roast, braised or boiled, lean only eaten	BEEF
21410000	BEEF, STEW MEAT, COOKED, NS AS TO FAT	Beef, stew meat, cooked, NS as to fat eaten	BEEF
21410110	BEEF, STEW MEAT, COOKED, LEAN & FAT	Beef, stew meat, cooked, lean and fat eaten	BEEF
21410120	BEEF, STEW MEAT, COOKED, LEAN ONLY	Beef, stew meat, cooked, lean only eaten	BEEF
21416000	CORNED BEEF, COOKED, NS AS TO FAT	Corned beef, cooked, NS as to fat eaten	BEEF
21416110	CORNED BEEF, COOKED, LEAN & FAT	Corned beef, cooked, lean and fat eaten	BEEF
21416120	CORNED BEEF, COOKED, LEAN ONLY	Corned beef, cooked, lean only eaten	BEEF
21416150	CORNED BEEF, CANNED, READY TO EAT	Corned beef, canned, ready-to-eat	BEEF
21417100	BEEF BRISKET, COOKED, NS AS TO FAT	Beef brisket, cooked, NS as to fat eaten	BEEF
21417110	BEEF BRISKET, COOKED, LEAN & FAT	Beef brisket, cooked, lean and fat eaten	BEEF
21417120	BEEF BRISKET, COOKED, LEAN ONLY	Beef brisket, cooked, lean only eaten	BEEF
21420100	BEEF, SANDWICH STEAK (FLAKED,FORMED, THINLY SLICED)	Beef, sandwich steak (flaked, formed, thinly sliced)	BEEF
21500000	GROUND BEEF, RAW	Ground beef, raw	BEEF
21500100	GROUND BEEF OR PATTY, NS AS TO %LEAN	Ground beef or patty, cooked, NS as to percent lean (formerly NS as to regular, lean,	BEEF
21500200	GROUND BEEF OR PATTY, BREADED, COOKED	Ground beef or patty, breaded, cooked	BEEF
21500300	GROUND BEEF PATTY, COOKED (FOR FAST FOOD SANDWICHES)	Ground beef patty, cooked (for fast food sandwiches)	BEEF
21501000	GROUND BEEF, LESS THAN 80% LEAN, COOKED	Ground beef, less than 80% lean, cooked (formerly regular)	BEEF
21501200	GROUND BEEF, 80% - 84% LEAN, COOKED	Ground beef, 80% - 84% lean, cooked (formerly lean)	BEEF
21501300	GROUND BEEF, 85% - 89% LEAN, COOKED	Ground beef, 85% - 89% lean, cooked (formerly extra lean)	BEEF
21501350	GROUND BEEF, 90% - 94% LEAN, COOKED	Ground beef, 90% - 94% lean, cooked	BEEF
21501360	GROUND BEEF, 95% OR MORE LEAN, COOKED	Ground beef, 95% or more lean, cooked	BEEF
21540100	GROUND BEEF W/ TEXTURED VEGETABLE PROTEIN, COOKED	Ground beef with textured vegetable protein, cooked	BEEF
21601000	BEEF, BACON, COOKED	Beef, bacon, cooked	BEEF
21601010	BEEF, BACON, REDUCED SODIUM, COOKED	Beef, bacon, reduced sodium, cooked	BEEF
21602000	BEEF, DRIED, CHIPPED, UNCOOKED	Beef, dried, chipped, uncooked	BEEF
21602010	BEEF, DRIED, CHIPPED, COOKED IN FAT	Beef, dried, chipped, cooked in fat	BEEF
21602100	BEEF JERKY	Beef jerky	BEEF
21603000	BEEF, PASTRAMI (BEEF, SMOKED, SPICED)	Beef, pastrami (beef, smoked, spiced)	BEEF
21701000	BEEF, BABY, NS AS TO STRAINED OR JUNIOR	Beef, baby food, NS as to strained or junior	BEEF
21701010	BEEF, BABY, STRAINED	Beef, baby food, strained	BEEF
21701020	BEEF, BABY, JUNIOR	Beef, baby food, junior	BEEF
22000100	PORK, NS AS TO CUT, COOKED, NS AS TO FAT EATEN	Pork, NS as to cut, cooked, NS as to fat eaten	PORK
22000110	PORK, NS AS TO CUT, COOKED, LEAN & FAT EATEN	Pork, NS as to cut, cooked, lean and fat eaten	PORK
22000120	PORK, NS AS TO CUT, COOKED, LEAN ONLY EATEN	Pork, NS as to cut, cooked, lean only eaten	PORK
22000200	PORK, NS AS TO CUT, FRIED, NS AS TO FAT EATEN	Pork, NS as to cut, fried, NS as to fat eaten	PORK
22000210	PORK, NS AS TO CUT, FRIED, LEAN & FAT EATEN	Pork, NS as to cut, fried, lean and fat eaten	PORK
22000220	PORK, NS AS TO CUT, FRIED, LEAN ONLY EATEN	Pork, NS as to cut, fried, lean only eaten	PORK

FoodCode	Long descrip	Short descrip	GROUPNAME
22000300	PORK, NS AS TO CUT, BREADED, FRIED, NS AS TO FAT	Pork, NS as to cut, breaded or floured, fried, NS as to fat eaten	PORK
22000310	PORK, NS AS TO CUT, BREADED, FRIED, FAT EATEN	Pork, NS as to cut, breaded or floured, fried, lean and fat eaten	PORK
22000320	PORK, NS AS TO CUT, BREADED, FRIED, LEAN ONLY	Pork, NS as to cut, breaded or floured, fried, lean only eaten	PORK
22001000	PORK, PICKLED, NS AS TO CUT	Pork, pickled, NS as to cut	PORK
22002000	PORK, GROUND OR PATTY, COOKED	Pork, ground or patty, cooked	PORK
22002100	PORK, GROUND, GROUND OR PATTY, BREADED, COOKED	Pork, ground or patty, breaded, cooked	PORK
22002800	PORK JERKY	Pork jerky	PORK
22101000	PORK CHOP, NS AS TO COOKING METHOD, NS AS TO FAT	Pork chop, NS as to cooking method, NS as to fat eaten	PORK
22101010	PORK CHOP, NS AS TO COOKING METHOD, LEAN & FAT	Pork chop, NS as to cooking method, lean and fat eaten	PORK
22101020	PORK CHOP, NS AS TO COOKING METHOD, LEAN ONLY	Pork chop, NS as to cooking method, lean only eaten	PORK
22101100	PORK CHOP, BROILED OR BAKED, NS AS TO FAT	Pork chop, broiled or baked, NS as to fat eaten	PORK
22101110	PORK CHOP, BROILED OR BAKED, LEAN & FAT	Pork chop, broiled or baked, lean and fat eaten	PORK
22101120	PORK CHOP, BROILED OR BAKED, LEAN ONLY	Pork chop, broiled or baked, lean only eaten	PORK
22101130	PORK CHOP, BREADED, BROILED OR BAKED, NS AS TO FAT	Pork chop, breaded or floured, broiled or baked, NS as to fat eaten	PORK
22101140	PORK CHOP, BREADED, BROILED OR BAKED, LEAN & FAT	Pork chop, breaded or floured, broiled or baked, lean and fat eaten	PORK
22101150	PORK CHOP, BREADED, BROILED OR BAKED, LEAN ONLY	Pork chop, breaded or floured, broiled or baked, lean only eaten	PORK
22101200	PORK CHOP, FRIED, NS AS TO FAT	Pork chop, fried, NS as to fat eaten	PORK
22101210	PORK CHOP, FRIED, LEAN & FAT	Pork chop, fried, lean and fat eaten	PORK
22101220	PORK CHOP, FRIED, LEAN ONLY	Pork chop, fried, lean only eaten	PORK
22101300	PORK CHOP, BREADED, FRIED, NS AS TO FAT	Pork chop, breaded or floured, fried, NS as to fat eaten	PORK
22101310	PORK CHOP, BREADED, FRIED, LEAN & FAT	Pork chop, breaded or floured, fried, lean and fat eaten	PORK
22101320	PORK CHOP, BREADED, FRIED, LEAN ONLY	Pork chop, breaded or floured, fried, lean only eaten	PORK
22101400	PORK CHOP, BATTERED, FRIED, NS AS TO FAT	Pork chop, battered, fried, NS as to fat eaten	PORK
22101410	PORK CHOP, BATTERED, FRIED, LEAN & FAT	Pork chop, battered, fried, lean and fat eaten	PORK
22101420	PORK CHOP, BATTERED, FRIED, LEAN ONLY	Pork chop, battered, fried, lean only eaten	PORK
22101500	PORK CHOP, STEWED, NS AS TO FAT EATEN	Pork chop, stewed, NS as to fat eaten	PORK
22101510	PORK CHOP, STEWED, LEAN & FAT EATEN	Pork chop, stewed, lean and fat eaten	PORK
22101520	PORK CHOP, STEWED, LEAN ONLY EATEN	Pork chop, stewed, lean only eaten	PORK
22107000	PORK CHOP, SMOKED OR CURED, COOKED, NS AS TO FAT	Pork chop, smoked or cured, cooked, NS as to fat eaten	PORK
22107010	PORK CHOP, SMOKED OR CURED, COOKED, LEAN & FAT	Pork chop, smoked or cured, cooked, lean and fat eaten	PORK
22107020	PORK CHOP, SMOKED OR CURED, COOKED, LEAN ONLY	Pork chop, smoked or cured, cooked, lean only eaten	PORK
22201000	PORK STEAK, NS AS TO COOKING METHOD, NS AS TO FAT	Pork steak or cutlet, NS as to cooking method, NS as to fat eaten	PORK
22201010	PORK STEAK, NS AS TO COOKING METHOD, LEAN & FAT	Pork steak or cutlet, NS as to cooking method, lean and fat eaten	PORK
22201020	PORK STEAK, NS AS TO COOKING METHOD, LEAN ONLY	Pork steak or cutlet, NS as to cooking method, lean only eaten	PORK
22201050	PORK STEAK OR CUTLET, BATTERED, FRIED, NS AS TO FAT	Pork steak or cutlet, battered, fried, NS as to fat eaten	PORK
22201060	PORK STEAK OR CUTLET, BATTERED, FRIED, LEAN & FAT	Pork steak or cutlet, battered, fried, lean and fat eaten	PORK
22201070	PORK STEAK OR CUTLET, BATTERED, FRIED, LEAN ONLY	Pork steak or cutlet, battered, fried, lean only eaten	PORK
22201100	PORK STEAK OR CUTLET, BROILED OR BAKD, NS AS TO FAT	Pork steak or cutlet, broiled or baked, NS as to fat eaten	PORK
22201110	PORK STEAK OR CUTLET, BROILED OR BAKED, LEAN & FAT	Pork steak or cutlet, broiled or baked, lean and fat eaten	PORK
22201120	PORK STEAK OR CUTLET, BROILED OR BAKED, LEAN ONLY	Pork steak or cutlet, broiled or baked, lean only eaten	PORK
22201200	PORK STEAK OR CUTLET, FRIED, NS AS TO FAT	Pork steak or cutlet, fried, NS as to fat eaten	PORK
22201210	PORK STEAK OR CUTLET, FRIED, LEAN & FAT	Pork steak or cutlet, fried, lean and fat eaten	PORK
22201220	PORK STEAK OR CUTLET, FRIED, LEAN ONLY	Pork steak or cutlet, fried, lean only eaten	PORK
22201300	PORK CUTLET, BREADED, BROILED/BAKED, NS AS TO FAT	Pork steak or cutlet, breaded or floured, broiled or baked, NS as to fat eaten	PORK
22201310	PORK CUTLET, BREADED, BROILED/BAKED, LEAN & FAT	Pork steak or cutlet, breaded or floured, broiled or baked, lean and fat eaten	PORK
22201320	PORK CUTLET, BREADED, BROILED/BAKED, LEAN ONLY	Pork steak or cutlet, breaded or floured, broiled or baked, lean only eaten	PORK
22201400	PORK STEAK OR CUTLET, BREADED, FRIED, NS AS TO FAT	Pork steak or cutlet, breaded or floured, fried, NS as to fat eaten	PORK
22201410	PORK STEAK OR CUTLET, BREADED, FRIED, LEAN & FAT	Pork steak or cutlet, breaded or floured, fried, lean and fat eaten	PORK
22201420	PORK STEAK OR CUTLET, BREADED, FRIED, LEAN ONLY	Pork steak or cutlet, breaded or floured, fried, lean only eaten	PORK
22210300	PORK, TENDERLOIN, COOKED, NS AS TO METHOD	Pork, tenderloin, cooked, NS as to cooking method	PORK
22210310	PORK, TENDERLOIN, BREADED, FRIED	Pork, tenderloin, breaded, fried	PORK
22210350	PORK, TENDERLOIN, BRAISED	Pork, tenderloin, braised	PORK
22210400	PORK, TENDERLOIN, BAKED	Pork, tenderloin, baked	PORK
22210450	PORK, TENDERLOIN, BATTERED, FRIED	Pork, tenderloin, battered, fried	PORK
22300120	HAM, FRIED, NS AS TO FAT	Ham, fried, NS as to fat eaten	HAM
22300130	HAM, FRIED, LEAN & FAT	Ham, fried, lean and fat eaten	HAM
22300140	HAM, FRIED, LEAN ONLY	Ham, fried, lean only eaten	HAM
22300150	HAM, BREADED, FRIED, NS AS TO FAT	Ham, breaded or floured, fried, NS as to fat eaten	HAM
22300160	HAM, BREADED, FRIED, LEAN & FAT	Ham, breaded or floured, fried, lean and fat eaten	HAM
22300170	HAM, BREADED, FRIED, LEAN ONLY	Ham, breaded or floured, fried, lean only eaten	HAM
22301000	HAM, FRESH, COOKED, NS AS TO FAT	Ham, fresh, cooked, NS as to fat eaten	HAM
22301110	HAM, FRESH, COOKED, LEAN & FAT	Ham, fresh, cooked, lean and fat eaten	HAM
22301120	HAM, FRESH, COOKED, LEAN ONLY	Ham, fresh, cooked, lean only eaten	HAM
22311000	HAM, SMOKED OR CURED, COOKED, NS AS TO FAT	Ham, smoked or cured, cooked, NS as to fat eaten	HAM
22311010	HAM, SMOKED OR CURED, COOKED, LEAN & FAT	Ham, smoked or cured, cooked, lean and fat eaten	HAM
22311020	HAM, SMOKED OR CURED, COOKED, LEAN ONLY	Ham, smoked or cured, cooked, lean only eaten	HAM
22311450	HAM, PROSCIUTTO	Ham, prosciutto	HAM
22311500	HAM, SMOKED OR CURED, CANNED, NS AS TO FAT EATEN	Ham, smoked or cured, canned, NS as to fat eaten	HAM
22311510	HAM, SMOKED OR CURED, CANNED, LEAN & FAT EATEN	Ham, smoked or cured, canned, lean and fat eaten	HAM
22311520	HAM, SMOKED OR CURED, CANNED, LEAN ONLY EATEN	Ham, smoked or cured, canned, lean only eaten	HAM
22321110	HAM, SMOKED OR CURED, GROUND PATTY	Ham, smoked or cured, ground patty	HAM
22400100	PORK ROAST, NS AS TO CUT, NS AS TO FAT	Pork roast, NS as to cut, cooked, NS as to fat eaten	PORK
22400110	PORK ROAST, NS AS TO CUT, COOKED, LEAN & FAT	Pork roast, NS as to cut, cooked, lean and fat eaten	PORK
22400120	PORK ROAST, NS AS TO CUT, COOKED, LEAN ONLY	Pork roast, NS as to cut, cooked, lean only eaten	PORK
22401000	PORK ROAST, LOIN, COOKED, NS AS TO FAT	Pork roast, loin, cooked, NS as to fat eaten	PORK
22401010	PORK ROAST, LOIN, COOKED, LEAN & FAT	Pork roast, loin, cooked, lean and fat eaten	PORK
22401020	PORK ROAST, LOIN, COOKED, LEAN ONLY	Pork roast, loin, cooked, lean only eaten	PORK
22402510	FRIED PORK CHUNKS, P.R. (CARNE DE CERDO FRITA)	Fried pork chunks, Puerto Rican style (Carne de cerdo frita, masitas fritas)	PORK
22411000	PORK ROAST, SHOULDER, COOKED, NS AS TO FAT	Pork roast, shoulder, cooked, NS as to fat eaten	PORK
22411010	PORK ROAST, SHOULDER, COOKED, LEAN & FAT	Pork roast, shoulder, cooked, lean and fat eaten	PORK
22411020	PORK ROAST, SHOULDER, COOKED, LEAN ONLY	Pork roast, shoulder, cooked, lean only eaten	PORK
22421000	PORK ROAST, SMOKED OR CURED, COOKED, NS AS TO FAT	Pork roast, smoked or cured, cooked, NS as to fat eaten	PORK
22421010	PORK ROAST, SMOKED OR CURED, COOKED, LEAN & FAT	Pork roast, smoked or cured, cooked, lean and fat eaten	PORK
22421020	PORK ROAST, SMOKED OR CURED, COOKED, LEAN ONLY	Pork roast, smoked or cured, cooked, lean only eaten	PORK
22431000	PORK ROLL, CURED, FRIED	Pork roll, cured, fried	PORK
22501010	BACON, CANADIAN, COOKED	Canadian bacon, cooked	PORK
22600100	BACON, NS AS TO TYPE OF MEAT, COOKED	Bacon, NS as to type of meat, cooked	PORK
22600110	BACON, NS AS TO TYPE OF MEAT, REDUCED SODIUM, COOKED	Bacon, NS as to type of meat, reduced sodium, cooked	PORK
22600200	PORK BACON, NS AS TO FRESH/SMOKED/CURED, COOKED	Pork bacon, NS as to fresh, smoked or cured, cooked	PORK
22600210	PORK BACON, NS AS TO FRESH, SMOKED OR CURED, RED SODIUM, CKD	Pork bacon, NS as to fresh, smoked or cured, reduced sodium, cooked	PORK
22601000	PORK BACON, SMOKED OR CURED, COOKED	Pork bacon, smoked or cured, cooked	PORK
22601040	BACON OR SIDE PORK, FRESH, COOKED	Bacon or side pork, fresh, cooked	PORK
22602010	PORK BACON, SMOKED OR CURED, REDUCED SODIUM, COOKED	Pork bacon, smoked or cured, reduced sodium, cooked	PORK
22621000	SALT PORK, COOKED	Salt pork, cooked	PORK
22621100	FAT BACK, COOKED (INCLUDE HOG JOWL)	Fat back, cooked	PORK
22701000	PORK, SPARERIBS, COOKED, NS AS TO FAT EATEN	Pork, spareribs, cooked, NS as to fat eaten	PORK
22701010	PORK, SPARERIBS, COOKED, LEAN & FAT	Pork, spareribs, cooked, lean and fat eaten	PORK
22701020	PORK, SPARERIBS, COOKED, LEAN ONLY	Pork, spareribs, cooked, lean only eaten	PORK
22701030	PORK, SPARERIBS, BBQ, W/ SAUCE, NS FAT EATEN	Pork, spareribs, barbecued, with sauce, NS as to fat eaten	PORK
22701040	PORK, SPARERIBS, BBQ, W/ SAUCE, LEAN & FAT EATEN	Pork, spareribs, barbecued, with sauce, lean and fat eaten	PORK
22701050	PORK, SPARERIBS, BBQ, W/ SAUCE, LEAN ONLY EATEN	Pork, spareribs, barbecued, with sauce, lean only eaten	PORK
22704010	PORK, CRACKLINGS, COOKED	Pork, cracklings, cooked	PORK
22705010	PORK, EARS, TAIL, HEAD, SNOUT, MISC PARTS, COOKED	Pork ears, tail, head, snout, miscellaneous parts, cooked	PORK
22706010	PORK, NECK BONES, COOKED	Pork, neck bones, cooked	PORK
22707010	PORK, PIG'S FEET, COOKED	Pork, pig's feet, cooked	PORK
22707020	PORK, PIG'S FEET, PICKLED	Pork, pig's feet, pickled	PORK
22708010	PORK, PIG'S HOCKS, COOKED	Pork, pig's hocks, cooked	PORK
22709010	PORK SKIN, RINDS, DEEP-FRIED	Pork skin, rinds, deep-fried	PORK
23000100	LAMB, NS AS TO CUT, COOKED	Lamb, NS as to cut, cooked	LAMB
23101000	LAMB CHOP, COOKED, NS AS TO CUT & FAT	Lamb chop, NS as to cut, cooked, NS as to fat eaten	LAMB
23101010	LAMB CHOP, NS AS TO CUT, COOKED, LEAN & FAT	Lamb chop, NS as to cut, cooked, lean and fat eaten	LAMB
23101020	LAMB CHOP, NS AS TO CUT, COOKED, LEAN ONLY	Lamb chop, NS as to cut, cooked, lean only eaten	LAMB
23104000	LAMB, LOIN CHOP, COOKED, NS AS TO FAT	Lamb, loin chop, cooked, NS as to fat eaten	LAMB
23104010	LAMB, LOIN CHOP, COOKED, LEAN & FAT	Lamb, loin chop, cooked, lean and fat eaten	LAMB
23104020	LAMB, LOIN CHOP, COOKED, LEAN ONLY	Lamb, loin chop, cooked, lean only eaten	LAMB
23107000	LAMB, SHOULDER CHOP, COOKED, NS AS TO FAT	Lamb, shoulder chop, cooked, NS as to fat eaten	LAMB

FoodCode	Long descrip	Short descrip	GROUPNAME
23107010	LAMB, SHOULDER CHOP, COOKED, LEAN & FAT	Lamb, shoulder chop, cooked, lean and fat eaten	LAMB
23107020	LAMB, SHOULDER CHOP, COOKED, LEAN ONLY	Lamb, shoulder chop, cooked, lean only eaten	LAMB
23110000	LAMB, RIBS, COOKED, LEAN ONLY	Lamb, ribs, cooked, lean only eaten	LAMB
23110010	LAMB, RIBS, COOKED, NS AS TO FAT	Lamb, ribs, cooked, NS as to fat eaten	LAMB
23110050	LAMB, RIBS, COOKED, LEAN & FAT	Lamb, ribs, cooked, lean and fat eaten	LAMB
23111010	LAMB HOCKS, COOKED	Lamb hocks, cooked	LAMB
23120100	LAMB, ROAST, COOKED, NS AS TO FAT EATEN	Lamb, roast, cooked, NS as to fat eaten	LAMB
23120110	LAMB, ROAST, COOKED, LEAN & FAT EATEN	Lamb, roast, cooked, lean and fat eaten	LAMB
23120120	LAMB, ROAST, COOKED, LEAN ONLY EATEN	Lamb, roast, cooked, lean only eaten	LAMB
23132000	LAMB, GROUND OR PATTY, COOKED	Lamb, ground or patty, cooked	LAMB
23200100	VEAL, COOKED, NS AS TO CUT & FAT	Veal, NS as to cut, cooked, NS as to fat eaten	BEEF
23200110	VEAL, NS AS TO CUT, COOKED, LEAN & FAT	Veal, NS as to cut, cooked, lean and fat eaten	BEEF
23200120	VEAL, NS AS TO CUT, COOKED, LEAN ONLY	Veal, NS as to cut, cooked, lean only eaten	BEEF
23201010	VEAL CHOP, NS AS TO COOKING METHOD, NS AS TO FAT	Veal chop, NS as to cooking method, NS as to fat eaten	BEEF
23201020	VEAL CHOP, NS AS TO COOKING METHOD, LEAN & FAT	Veal chop, NS as to cooking method, lean and fat eaten	BEEF
23201030	VEAL CHOP, NS AS TO COOKING METHOD, LEAN ONLY	Veal chop, NS as to cooking method, lean only eaten	BEEF
23203010	VEAL CHOP, FRIED, NS AS TO FAT	Veal chop, fried, NS as to fat eaten	BEEF
23203020	VEAL CHOP, FRIED, LEAN & FAT	Veal chop, fried, lean and fat eaten	BEEF
23203030	VEAL CHOP, FRIED, LEAN ONLY	Veal chop, fried, lean only eaten	BEEF
23203100	VEAL CHOP, BROILED, NS AS TO FAT	Veal chop, broiled, NS as to fat eaten	BEEF
23203110	VEAL CHOP, BROILED, LEAN & FAT	Veal chop, broiled, lean and fat eaten	BEEF
23203120	VEAL CHOP, BROILED, LEAN ONLY	Veal chop, broiled, lean only eaten	BEEF
23204010	VEAL CUTLET, NS AS TO COOKING METHOD, NS AS TO FAT	Veal cutlet or steak, NS as to cooking method, NS as to fat eaten	BEEF
23204020	VEAL CUTLET, NS AS TO COOKING METHOD, LEAN & FAT	Veal cutlet or steak, NS as to cooking method, lean and fat eaten	BEEF
23204030	VEAL CUTLET, NS AS TO COOKING METHOD, LEAN ONLY	Veal cutlet or steak, NS as to cooking method, lean only eaten	BEEF
23204200	VEAL CUTLET OR STEAK, BROILED, NS AS TO FAT	Veal cutlet or steak, broiled, NS as to fat eaten	BEEF
23204210	VEAL CUTLET OR STEAK, BROILED, LEAN & FAT	Veal cutlet or steak, broiled, lean and fat eaten	BEEF
23204220	VEAL CUTLET OR STEAK, BROILED, LEAN ONLY	Veal cutlet or steak, broiled, lean only eaten	BEEF
23205010	VEAL CUTLET OR STEAK, FRIED, NS AS TO FAT	Veal cutlet or steak, fried, NS as to fat eaten	BEEF
23205020	VEAL CUTLET OR STEAK, FRIED, LEAN & FAT	Veal cutlet or steak, fried, lean and fat eaten	BEEF
23205030	VEAL CUTLET OR STEAK, FRIED, LEAN ONLY	Veal cutlet or steak, fried, lean only eaten	BEEF
23210010	VEAL, ROASTED, NS AS TO FAT	Veal, roasted, NS as to fat eaten	BEEF
23210020	VEAL, ROASTED, LEAN & FAT	Veal, roasted, lean and fat eaten	BEEF
23210030	VEAL, ROASTED, LEAN ONLY	Veal, roasted, lean only eaten	BEEF
23220010	VEAL, GROUND OR PATTY, COOKED	Veal, ground or patty, cooked	BEEF
24100000	CHICKEN, NS AS TO PART, NS METHOD, SKIN	Chicken, NS as to part and cooking method, NS as to skin eaten	POULTRY
24100010	CHICKEN, NS AS TO PART, NS METHOD, W/ SKIN	Chicken, NS as to part and cooking method, skin eaten	POULTRY
24100020	CHICKEN, NS AS TO PART, NS METHOD, W/O SKIN	Chicken, NS as to part and cooking method, skin not eaten	POULTRY
24102000	CHICKEN, NS PART, ROASTED/BROILED/BAKED, NS SKIN	Chicken, NS as to part, roasted, broiled, or baked, NS as to skin eaten	POULTRY
24102010	CHICKEN, NS PART, ROASTED/BROILED/BAKED, W/ SKIN	Chicken, NS as to part, roasted, broiled, or baked, skin eaten	POULTRY
24102020	CHICKEN, NS PART, ROASTED/BROILED/BAKED, W/O SKIN	Chicken, NS as to part, roasted, broiled, or baked, skin not eaten	POULTRY
24103000	CHICKEN, STEWED, NS PART, NS SKIN	Chicken, NS as to part, stewed, NS as to skin eaten	POULTRY
24103010	CHICKEN, STEWED, NS PART, W/ SKIN	Chicken, NS as to part, stewed, skin eaten	POULTRY
24103020	CHICKEN, STEWED, NS PART, W/O SKIN	Chicken, NS as to part, stewed, skin not eaten	POULTRY
24104000	CHICK, NS PART, FRIED, NO COAT, NS AS TO SKIN EATEN, FAT ADD	Chicken, NS as to part, fried, no coating, NS as to skin eaten, fat added in cooking	POULTRY
24104001	CHICK, NS PART, FRIED, NO COAT, NS TO SKIN EATEN, NO FAT	Chicken, NS as to part, fried, no coating, NS as to skin eaten, fat not added in cookin	POULTRY
24104010	CHICK, NS AS TO PART, FRIED, NO COAT, SKIN EATEN, FAT ADDED	Chicken, NS as to part, fried, no coating, skin eaten, fat added in cooking	POULTRY
24104011	CHICK, NS AS PART, FRIED, NO COAT, SKIN EATEN, FAT NOT ADDED	Chicken, NS as to part, fried, no coating, skin eaten, fat not added in cooking	POULTRY
24104020	CHICK, NS TO PART, FRIED, NO COAT, SKIN NOT EATEN, FAT ADDED	Chicken, NS as to part, fried, no coating, skin not eaten, fat added in cooking	POULTRY
24104021	CHICK, NS PART, FRIED, NO COAT, SKIN NOT EATEN, NO FAT ADDED	Chicken, NS as to part, fried, no coating, skin not eaten, fat not added in cooking	POULTRY
24107000	CHICK, COAT, BKD/FRD, PPD W/ SKIN, NS SKIN EATEN, FAT ADDED	Chicken, NS as to part, coated, baked or fried, prepared with skin, NS as to skin/coati	POULTRY
24107001	CHICK, COAT, BKD/FRD, PPD W/ SKIN, NS SKIN EATEN, NO FAT	Chicken, NS as to part, coated, baked or fried, prepared with skin, NS as to skin/coati	POULTRY
24107010	CHICK, COAT, BAKED/FRIED, PPD W/ SKN, SKN EATEN, FAT ADDED	Chicken, NS as to part, coated, baked or fried, prepared with skin, skin/coating eaten,	POULTRY
24107011	CHICK, COATED, BAKED/FRIED, PPD W/ SKN, SKN EATEN, NO FAT AD	Chicken, NS as to part, coated, baked or fried, prepared with skin, skin/coating eaten,	POULTRY
24107020	CHICK, COAT, BKD/FRD, PPD W/ SKN, SKN NOT EATEN, FAT ADDED	Chicken, NS as to part, coated, baked or fried, prepared with skin, skin/coating not ea	POULTRY
24107021	CHICK, COAT, BKD/FRD, PPD W/ SKIN, SKIN NOT EATEN, NO FAT AD	Chicken, NS as to part, coated, baked or fried, prepared with skin, skin/coating not ea	POULTRY
24107040	CHICK, COAT, BKD/FRD, PPD SKNLES, NS COAT EATEN, FAT ADDED	Chicken, NS as to part, coated, baked or fried, prepared skinless, NS as to coating ea	POULTRY
24107041	CHICK, NS PART,COAT,BKD/FRD,PPD SKNLES,NS COAT EATEN, NO FAT	Chicken, NS as to part, coated, baked or fried, prepared skinless, NS as to coating ea	POULTRY
24107050	CHICK,NS PART,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,FATADDED	Chicken, NS as to part, coated, baked or fried, prepared skinless, coating eaten, fat a	POULTRY
24107051	CHICK,NS PART,COAT,BKD/FRD,PPD SKNLES, COAT EATEN, NO FAT AD	Chicken, NS as to part, coated, baked or fried, prepared skinless, coating eaten, fat n	POULTRY
24107060	CHICK,NS PART,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN,FAT ADD	Chicken, NS as to part, coated, baked or fried, prepared skinless, coating not eaten, f	POULTRY
24107061	CHICK,NS PART,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN, NO FAT	Chicken, NS as to part, coated, baked or fried, prepared skinless, coating not eaten, f	POULTRY
24120100	CHICKEN, BREAST, NFS	Chicken, breast, NS as to cooking method, NS as to skin eaten	POULTRY
24120110	CHICKEN, BREAST, NS AS TO COOKING METHOD, W/SKIN	Chicken, breast, NS as to cooking method, skin eaten	POULTRY
24120120	CHICKEN, BREAST, NS AS TO COOKING METHOD, W/O SKIN	Chicken, breast, NS as to cooking method, skin not eaten	POULTRY
24122100	CHICKEN, BREAST, ROASTED/BROILED/BAKED, NS SKIN	Chicken, breast, roasted, broiled, or baked, NS as to skin eaten	POULTRY
24122110	CHICKEN, BREAST, ROASTED/BROILED/BAKED, W/ SKIN	Chicken, breast, roasted, broiled, or baked, skin eaten	POULTRY
24122120	CHICKEN, BREAST, ROASTED/BROILED/BAKED, W/O SKIN	Chicken, breast, roasted, broiled, or baked, skin not eaten	POULTRY
24123100	CHICKEN, BREAST, STEWED, NS AS TO SKIN	Chicken, breast, stewed, NS as to skin eaten	POULTRY
24123110	CHICKEN, BREAST, STEWED, W/ SKIN	Chicken, breast, stewed, skin eaten	POULTRY
24123120	CHICKEN, BREAST, STEWED, W/O SKIN	Chicken, breast, stewed, skin not eaten	POULTRY
24124100	CHICK, BREAST, FRD, NO COAT, NS AS TO SKIN EATEN, FAT ADDED	Chicken, breast, fried, no coating, NS as to skin eaten, fat added in cooking	POULTRY
24124101	CHICK,BREAST, FRIED, NO COAT, NS AS TO SKIN EATEN, NO FAT AD	Chicken, breast, fried, no coating, NS as to skin eaten, fat not added in cooking	POULTRY
24124110	CHICK, BREAST, FRIED, NO COAT, SKIN EATEN, NS TO TYPE OF FAT	Chicken, breast, fried, no coating, skin eaten, NS as to type of fat added in cooking	POULTRY
24124111	CHICKEN, BREAST, FRIED, NO COATING, W/ SKIN, W/ SHORTENING	Chicken, breast, fried, no coating, skin eaten, made with shortening	POULTRY
24124112	CHICKEN, BREAST, FRIED, NO COATING, W/ SKIN, MADE WITH BUTTE	Chicken, breast, fried, no coating, skin eaten, made with butter	POULTRY
24124113	CHICKEN, BREAST, FRIED, NO COATING, W/ SKIN, W/ OIL	Chicken, breast, fried, no coating, skin eaten, made with oil	POULTRY
24124114	CHICKEN, BREAST, FRIED, NO COATING, W/ SKIN, W/ COOK SPRAY	Chicken, breast, fried, no coating, skin eaten, made with cooking spray	POULTRY
24124115	CHICKEN, BREAST, FRIED, NO COATING, W/ SKIN, MADE W/OUT FAT	Chicken, breast, fried, no coating, skin eaten, made without fat	POULTRY
24124120	CHICK, BRST, FRD, NO COAT, SKIN NOT EATEN, NS TO TYPE OF FAT	Chicken, breast, fried, no coating, skin not eaten, NS as to type of fat added in cookin	POULTRY
24124121	CHICKEN, BREAST, FRIED, NO COATING, W/O SKIN, W/ SHORTENING	Chicken, breast, fried, no coating, skin not eaten, made with shortening	POULTRY
24124122	CHICKEN, BREAST, FRIED, NO COATING, W/O SKIN, MADE W/ BUTTER	Chicken, breast, fried, no coating, skin not eaten, made with butter	POULTRY
24124123	CHICKEN, BREAST, FRIED, NO COATING, W/O SKIN, MADE W/ OIL	Chicken, breast, fried, no coating, skin not eaten, made with oil	POULTRY
24124124	CHICKEN, BREAST, FRIED, NO COATING, W/O SKIN, W/ COOK SPRAY	Chicken, breast, fried, no coating, skin not eaten, made with cooking spray	POULTRY
24124125	CHICKEN, BREAST, FRIED, NO COATING, W/O SKIN, MADE W/O FAT	Chicken, breast, fried, no coating, skin not eaten, made without fat	POULTRY
24127100	CHICK, BRST, COAT,BKD/FRD,PPD W/ SKN,NS COAT EATEN,FAT ADDED	Chicken, breast, coated, baked or fried, prepared with skin, NS as to skin/coating eate	POULTRY
24127101	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,NS SKIN EATEN, NO FAT ADD	Chicken, breast, coated, baked or fried, prepared with skin, NS as to skin/coating eate	POULTRY
24127110	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN,NS TO FAT ADDED	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, NS as	POULTRY
24127111	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN, SKN EATEN, W/ SHORTENING	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made	POULTRY
24127112	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN,MADE W/ BUTTER	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made	POULTRY
24127113	CHICK, BRST,COAT,BKD/FRD,PPD W/ SKN, SKN EATEN, MADE W/ OIL	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made	POULTRY
24127114	CHICK, BRST,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN, W/ COOK SPRAY	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made	POULTRY
24127115	CHICK, BRST,COAT,BKD/FRD,PPD W/ SKN, SKN EATEN, MADE W/O FAT	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating eaten, made	POULTRY
24127119	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN, SKN NOT EAT,MADE W/O FAT	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, ma	POULTRY
24127120	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,SKN NOT EATEN, NS TO FAT	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, NS	POULTRY
24127121	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,SKN NOT EATEN, W/ SHORTEN	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, ma	POULTRY
24127122	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,SKIN NOT EATEN, W/ BUTTER	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, ma	POULTRY
24127123	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN,SKN NOT EATEN, W/ OIL	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, ma	POULTRY
24127124	CHICK,BRST,COAT,BKD/FRD,PPD W/ SKN, SKN NOT EAT,W/COOK SPRAY	Chicken, breast, coated, baked or fried, prepared with skin, skin/coating not eaten, ma	POULTRY
24127125	CHIC, BREAST, FF, COATED/BAKED/FRIED, PREP SKIN,NS SKIN EATE	Chicken, breast, from fast food, coated, baked or fried, prepared with skin, NS as to sl	POULTRY
24127130	CHIC, BREAST, FF, COATED, BAKED/FRIED, PREP SKIN,SKIN EATEN	Chicken, breast, from fast food, coated, baked or fried, prepared with skin, skin/coatin	POULTRY
24127135	CHICK,BREAST,FF,COATED, BAKED/ FRIED,PREP SKIN,NO SKIN EATEN	Chicken, breast, from fast food, coated, baked or fried, prepared with skin, skin/coatin	POULTRY
24127140	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES,NS TO COAT EATEN, FAT ADD	Chicken, breast, coated, baked or fried, prepared skinless, NS as to coating eaten, fat	POULTRY
24127141	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES,NS COAT EATEN, NO FAT ADD	Chicken, breast, coated, baked or fried, prepared skinless, NS as to coating eaten, fat	POULTRY
24127150	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES, COAT EATEN, NS AS TO FAT	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, NS as to typ	POULTRY
24127151	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, W/ SHORTENING	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with s	POULTRY
24127152	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,MADE W/ BUTTER	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with b	POULTRY
24127153	CHICKEN,BREAST,COAT,BKD/FRD,PPD SKINLESS,COAT EATEN, W/ OIL	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with c	POULTRY
24127154	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, W/ COOK SPRAY	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made with c	POULTRY
24127155	CHICK,BREAST,COATED,BKD/FRD,PPD SKINLESS,COAT EATEN, W/O FAT	Chicken, breast, coated, baked or fried, prepared skinless, coating eaten, made witho	POULTRY
24127160	CHIC,BRST,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT, NS TYPE FAT	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, NS as t	POULTRY
24127161	CHIC,BRST,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,W/ SHORTENING	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made w	POULTRY
24127162	CHIC,BRST,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT, W/ BUTTER	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made w	POULTRY
24127163	CHIC,BRST,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT, MADE W/ OIL	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made w	POULTRY
24127164	CHICK,BRST,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,W/COOK SPRAY	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made w	POULTRY
24127165	CHIC,BRST,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,MADE W/O FAT	Chicken, breast, coated, baked or fried, prepared skinless, coating not eaten, made w	POULTRY

FoodCode	Long descrip	Short descrip	GROUPNAME
24130200	CHICKEN, LEG, NFS	Chicken, leg (drumstick and thigh), NS as to cooking method, NS as to skin eaten	POULTRY
24130210	CHICKEN, LEG, NS AS TO COOKING METHOD, W/ SKIN	Chicken, leg (drumstick and thigh), NS as to cooking method, skin eaten	POULTRY
24130220	CHICKEN, LEG, NS AS TO COOKING METHOD, W/O SKIN	Chicken, leg (drumstick and thigh), NS as to cooking method, skin not eaten	POULTRY
24132200	CHICKEN, LEG, ROASTED/BROILED/BAKED, NS SKIN	Chicken, leg (drumstick and thigh), roasted, broiled, or baked, NS as to skin eaten	POULTRY
24132210	CHICKEN, LEG, ROASTED/BROILED/BAKED, W/ SKIN	Chicken, leg (drumstick and thigh), roasted, broiled, or baked, skin eaten	POULTRY
24132220	CHICKEN, LEG, ROASTED/BROILED/BAKED, W/O SKIN	Chicken, leg (drumstick and thigh), roasted, broiled, or baked, skin not eaten	POULTRY
24133200	CHICKEN, LEG, STEWED, NS AS TO SKIN	Chicken, leg (drumstick and thigh), stewed, NS as to skin eaten	POULTRY
24133210	CHICKEN, LEG, STEWED, W/ SKIN	Chicken, leg (drumstick and thigh), stewed, skin eaten	POULTRY
24133220	CHICKEN, LEG, STEWED, W/O SKIN	Chicken, leg (drumstick and thigh), stewed, skin not eaten	POULTRY
24134200	CHIC,LEG(DRMSTIK&THIGH),FRD,NO COAT,NS TO SKN EATEN, FAT ADD	Chicken, leg (drumstick and thigh), fried, no coating, NS as to skin eaten, fat added in	POULTRY
24134201	CHIC,LEG,FRD,NO COAT, NS AS TO SKN EATEN, FAT NOT ADDED	Chicken, leg (drumstick and thigh), fried, no coating, NS as to skin eaten, fat not adde	POULTRY
24134210	CHICK,LEG(DRMSTIK&THIGH),FRIED,NO COAT, SKN EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), fried, no coating, skin eaten, fat added in cooking	POULTRY
24134211	CHICKEN, LEG, FRIED, NO COATING,SKN EATEN, FAT NOT ADDED	Chicken, leg (drumstick and thigh), fried, no coating, skin eaten, fat not added in cook	POULTRY
24134220	CHIC,LEG(DRMSTIK&THIGH),FRD,NO COAT,SKN NOT EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), fried, no coating, skin not eaten, fat added in cook	POULTRY
24134221	CHICKEN, LEG, FRIED, NO COATING,SKN NOT EATEN, FAT NOT ADDED	Chicken, leg (drumstick and thigh), fried, no coating, skin not eaten, fat not added in c	POULTRY
24137200	CHIC,LEG,COAT,BKD/FRD,PPD W/ SKN,NS TO SKIN EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, NS as t	POULTRY
24137201	CHIC,LEG,COAT,BKD.FRD,PPD W/ SKN,NS TO SKIN EAT, FAT NOT ADD	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, NS as t	POULTRY
24137210	CHICK,LEG,COAT,BAKED/FRIED,PPD W/ SKN,SKN EATEN,FAT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coa	POULTRY
24137211	CHICK,LEG,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN, FAT NOT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coa	POULTRY
24137220	CHIC,LEG,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coa	POULTRY
24137221	CHIC,LEG,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN, FAT NOT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared with skin, skin/coa	POULTRY
24137240	CHIC,LEG,COAT,BKD/FRD,PPD SKNLES,NS COAT EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, NS as to	POULTRY
24137241	CHIC,LEG,COAT,BKD/FRD,PPD SKNLES,NS COAT EATEN,FAT NOT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, NS as to	POULTRY
24137250	CHICK,LEG,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating	POULTRY
24137251	CHICK,LEG,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, FAT NOT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating	POULTRY
24137260	CHICK,LEG,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN, FAT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating	POULTRY
24137261	CHICK,LEG,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,FAT NOT ADDED	Chicken, leg (drumstick and thigh), coated, baked or fried, prepared skinless, coating	POULTRY
24140200	CHICKEN, DRUMSTICK, NFS	Chicken, drumstick, NS as to cooking method, NS as to skin eaten	POULTRY
24140210	CHICKEN, DRUMSTICK, NS AS TO COOKING METHOD,W/ SKIN	Chicken, drumstick, NS as to cooking method, skin eaten	POULTRY
24140220	CHICKEN, DRUMSTICK, NS COOKING METHOD, W/O SKIN	Chicken, drumstick, NS as to cooking method, skin not eaten	POULTRY
24142200	CHICKEN, DRUMSTICK, ROASTED/BROILED/BAKED, NS SKIN	Chicken, drumstick, roasted, broiled, or baked, NS as to skin eaten	POULTRY
24142210	CHICKEN, DRUMSTICK, ROASTED/BROILED/BAKED, W/ SKIN	Chicken, drumstick, roasted, broiled, or baked, skin eaten	POULTRY
24142220	CHICKEN, DRUMSTICK, ROASTED/BROILED/BAKED, W/O SKIN	Chicken, drumstick, roasted, broiled, or baked, skin not eaten	POULTRY
24143200	CHICKEN, DRUMSTICK, STEWED, NS AS TO SKIN	Chicken, drumstick, stewed, NS as to skin eaten	POULTRY
24143210	CHICKEN, DRUMSTICK, STEWED, W/ SKIN	Chicken, drumstick, stewed, skin eaten	POULTRY
24143220	CHICKEN, DRUMSTICK, STEWED, W/O SKIN	Chicken, drumstick, stewed, skin not eaten	POULTRY
24144200	CHICKEN, DRUMSTICK, FRIED, NO COAT, NS SKN EATEN, FAT ADDED	Chicken, drumstick, fried, no coating, NS as to skin eaten, fat added in cooking	POULTRY
24144201	CHICK,DRMSTIK,FRD,NO COAT,NS SKIN EATEN, FAT NOT ADDED	Chicken, drumstick, fried, no coating, NS as to skin eaten, fat not added in cooking	POULTRY
24144210	CHICK, DRUMSTICK, FRIED, NO COAT, SKN EATEN, NS TO FAT ADDED	Chicken, drumstick, fried, no coating, skin eaten, NS as to type of fat added in cookin	POULTRY
24144211	CHICK,DRMSTIK,FRD,NO COAT,SKN EATEN, MADE W/ SHORTENING	Chicken, drumstick, fried, no coating, skin eaten, made with shortening	POULTRY
24144212	CHICKEN, DRUMSTICK, FRIED, NO COATING, SKN EATEN, W/ BUTTER	Chicken, drumstick, fried, no coating, skin eaten, made with butter	POULTRY
24144213	CHIC, DRUMSTICK, FRIED, NO COATING, SKN EATEN, MADE W/ OIL	Chicken, drumstick, fried, no coating, skin eaten, made with oil	POULTRY
24144214	CHICK, DRUMSTICK, FRIED, NO COAT, SKN EATEN, W/ COOK SPRAY	Chicken, drumstick, fried, no coating, skin eaten, made with cooking spray	POULTRY
24144215	CHICK, DRUMSTICK, FRIED, NO COAT, SKIN EATEN, MADE W/O FAT	Chicken, drumstick, fried, no coating, skin eaten, made without fat	POULTRY
24144220	CHICK,DRUMSTIK,FRIED,NO COAT, SKIN NOT EATEN, NS TYPE OF FAT	Chicken, drumstick, fried, no coating, skin not eaten, NS as to type of fat added in coc	POULTRY
24144221	CHIC,DRMSTIK,FRD, NO COAT, SKN NOT EATEN, MADE W/ SHORTENING	Chicken, drumstick, fried, no coating, skin not eaten, made with shortening	POULTRY
24144222	CHIC,DRUMSTIK,FRIED,NO COAT, SKN NOT EATEN, MADE W/ BUTTER	Chicken, drumstick, fried, no coating, skin not eaten, made with butter	POULTRY
24144223	CHICKEN, DRUMSTICK, FRIED, NO COATING, W/O SKIN, MADE W/ OIL	Chicken, drumstick, fried, no coating, skin not eaten, made with oil	POULTRY
24144224	CHICKEN, DRUMSTICK, FRIED, NO COAT, W/O SKIN, W/ COOK SPRAY	Chicken, drumstick, fried, no coating, skin not eaten, made with cooking spray	POULTRY
24144225	CHICKEN, DRUMSTICK, FRIED, NO COAT, W/O SKIN, MADE W/O FAT	Chicken, drumstick, fried, no coating, skin not eaten, made without fat	POULTRY
24147119	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN NOT EAT, MADE W/O FAT	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten,	POULTRY
24147200	CHIC,DRMSTIK,COAT,BKD/FRD,PPD W/SKN,NS SKN EATEN, FAT ADDED	Chicken, drumstick, coated, baked or fried, prepared with skin, NS as to skin/coating e	POULTRY
24147201	CHIC,DRMSTIK,COAT,BKD/FRD/PPD W/SKN,NS SKN EATEN,FAT NOT ADD	Chicken, drumstick, coated, baked or fried, prepared with skin, NS as to skin/coating e	POULTRY
24147210	CHIC,DRMSTK,COAT,BKE/FRD,PPD W/SKN,SKN EATEN,NS TYPE FAT ADD	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, NS	POULTRY
24147211	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN,W/ SHORTENING	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, ma	POULTRY
24147212	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN,MADE W/ BUTTER	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, ma	POULTRY
24147213	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN EATEN, MADE W/ OIL	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, ma	POULTRY
24147214	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN EATEN,W/ COOK SPRAY	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, ma	POULTRY
24147215	CHIC,DRMSTICK,COAT,BKD/FRD,PPD W/SKIN, SKIN EAT,MADE W/O FAT	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating eaten, ma	POULTRY
24147220	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN NOT EAT, NS TYPE FAT	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten,	POULTRY
24147221	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN NOT EAT,W/ SHORTENING	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten,	POULTRY
24147222	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN NOT EAT, W/ BUTTER	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten,	POULTRY
24147223	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN NOT EAT, MADE W/ OIL	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten,	POULTRY
24147224	CHIC,DRMSTK,COAT,BKD/FRD,PPD W/SKN,SKN NOT EAT,W/ COOK SPRAY	Chicken, drumstick, coated, baked or fried, prepared with skin, skin/coating not eaten,	POULTRY
24147225	CHICK,DRUMSTICK,FF,COATED,BAKED/FRIED,PREP SKIN,NS SKIN EAT	Chicken, drumstick, from fast food, coated, baked or fried, prepared with skin, NS as t	POULTRY
24147230	CHIC, DRUMSTICK,FF,COATED, BAKED/FRIED,PREP SKIN,SKIN EATEN	Chicken, drumstick, from fast food, coated, baked or fried, prepared with skin, skin/co	POULTRY
24147235	CHICK,DRUMSTICK,FF,COATED,BAKED/FRIED,PREP SKIN,SKIN NOT EAT	Chicken, drumstick, from fast food, coated, baked or fried, prepared with skin, skin/co	POULTRY
24147240	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,NS TO COAT EAT,FAT ADDED	Chicken, drumstick, coated, baked or fried, prepared skinless, NS as to coating eaten,	POULTRY
24147241	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,NS COAT EAT,FAT NOT ADD	Chicken, drumstick, coated, baked or fried, prepared skinless, NS as to coating eaten,	POULTRY
24147250	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, NS TYPE FAT	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, NS as to	POULTRY
24147251	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,W/ SHORTENING	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made wi	POULTRY
24147252	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,MADE W/BUTTER	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made wi	POULTRY
24147253	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKINLESS, COAT EAT,MADE W/ OIL	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made wi	POULTRY
24147254	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, W/COOK SPRAY	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made wi	POULTRY
24147255	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT EATED, MADE W/O FAT	Chicken, drumstick, coated, baked or fried, prepared skinless, coating eaten, made wi	POULTRY
24147260	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,NS TYPE FAT	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, NS a	POULTRY
24147261	CHIC,DRMSTK,COAT,BKD/FRD,PPL SKNLES,COAT NOT EAT,W/ SHORTENI	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, mad	POULTRY
24147262	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT, W/ BUTTER	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, mad	POULTRY
24147263	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,MADE W/ OIL	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, mad	POULTRY
24147264	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,W/COOK SPRA	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, mad	POULTRY
24147265	CHIC,DRMSTK,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,MADE W/OFAT	Chicken, drumstick, coated, baked or fried, prepared skinless, coating not eaten, mad	POULTRY
24150200	CHICKEN, THIGH, NFS	Chicken, thigh, NS as to cooking method, NS as to skin eaten	POULTRY
24150210	CHICKEN, THIGH, NS AS TO COOKING METHOD, W/ SKIN	Chicken, thigh, NS as to cooking method, skin eaten	POULTRY
24150220	CHICKEN, THIGH, NS AS TO COOKING METHOD, W/O SKIN	Chicken, thigh, NS as to cooking method, skin not eaten	POULTRY
24152200	CHICKEN, THIGH, ROASTED/BROILED/BAKED, NS SKIN	Chicken, thigh, roasted, broiled, or baked, NS as to skin eaten	POULTRY
24152210	CHICKEN, THIGH, ROASTED/BROILED/BAKED, W/ SKIN	Chicken, thigh, roasted, broiled, or baked, skin eaten	POULTRY
24152220	CHICKEN, THIGH, ROASTED/BROILED/BAKED, W/O SKIN	Chicken, thigh, roasted, broiled, or baked, skin not eaten	POULTRY
24153200	CHICKEN, THIGH, STEWED, NS AS TO SKIN	Chicken, thigh, stewed, NS as to skin eaten	POULTRY
24153210	CHICKEN, THIGH, STEWED, W/ SKIN	Chicken, thigh, stewed, skin eaten	POULTRY
24153220	CHICKEN, THIGH, STEWED, W/O SKIN	Chicken, thigh, stewed, skin not eaten	POULTRY
24154200	CHICKEN,THIGH, FRIED,NO COAT, NS AS TO SKIN EATEN, FAT ADDED	Chicken, thigh, fried, no coating, NS as to skin eaten, fat added in cooking	POULTRY
24154201	CHICK,THIGH, FRIED,NO COAT, NS AS TO SKIN, FAT NOT ADDED	Chicken, thigh, fried, no coating, NS as to skin eaten, fat not added in cooking	POULTRY
24154210	CHICK, THIGH, FRIED, NO COAT, SKN EATEN, NS TO TYPE OF FAT	Chicken, thigh, fried, no coating, skin eaten, NS as to type of fat added in cooking	POULTRY
24154211	CHICK, THIGH, FRIED, NO COAT, SKIN EATEN, MADE W/ SHORTENING	Chicken, thigh, fried, no coating, skin eaten, made with shortening	POULTRY
24154212	CHICK, THIGH, FRIED, NO COATING, SKIN EATEN, MADE W/ BUTTER	Chicken, thigh, fried, no coating, skin eaten, made with butter	POULTRY
24154213	CHICKEN, THIGH, FRIED, NO COATING, SKIN EATEN, MADE WITH OIL	Chicken, thigh, fried, no coating, skin eaten, made with oil	POULTRY
24154214	CHICK, THIGH, FRIED, NO COAT, SKIN EATEN, MADE W/ COOK SRAY	Chicken, thigh, fried, no coating, skin eaten, made with cooking spray	POULTRY
24154215	CHICKEN, THIGH, FRIED, NO COATING, SKIN EATEN, MADE W/O FAT	Chicken, thigh, fried, no coating, skin eaten, made without fat	POULTRY
24154220	CHICK, THIGH, FRIED, NO COAT, SKIN NOT EATEN, NS TYPE OF FAT	Chicken, thigh, fried, no coating, skin not eaten, NS as to type of fat added in cooking	POULTRY
24154221	CHICK,THIGH, FRIED,NO COAT,SKN NOT EATEN,MADE W/ SHORTENING	Chicken, thigh, fried, no coating, skin not eaten, made with shortening	POULTRY
24154222	CHICK, THIGH, FRIED, NO COAT, SKN NOT EATEN, MADE W/ BUTTER	Chicken, thigh, fried, no coating, skin not eaten, made with butter	POULTRY
24154223	CHICKEN, THIGH, FRIED, NO COAT, SKIN NOT EATEN, MADE W/ OIL	Chicken, thigh, fried, no coating, skin not eaten, made with oil	POULTRY
24154224	CHICK,THIGH,FRIED,NO COAT,SKIN NOT EATEN, MADE W/ COOK SPRAY	Chicken, thigh, fried, no coating, skin not eaten, made with cooking spray	POULTRY
24154225	CHICKEN, THIGH, FRIED, NO COAT, SKIN NOT EATEN, MADE W/O FAT	Chicken, thigh, fried, no coating, skin not eaten, made without fat	POULTRY
24157119	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,MADE W/O FAT	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, mac	POULTRY
24157200	CHICK,THIGH,COAT,BKD/FRD,PPD W/SKN,NS SKN EATEN, FAT ADDED	Chicken, thigh, coated, baked or fried, prepared with skin, NS as to skin/coating eaten	POULTRY
24157201	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,NS SKN EATEN, FAT NOT ADD	Chicken, thigh, coated, baked or fried, prepared with skin, NS as to skin/coating eaten	POULTRY
24157210	CHICK,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN EATEN, NS TYPE OF FAT	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, NS as t	POULTRY
24157211	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN EATEN, W/ SHORTENING	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made w	POULTRY
24157212	CHICKEN,THIGH,COATED,BKD/FRD,PPD W/SKIN,SKIN EATEN,W/ BUTTER	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made w	POULTRY
24157213	CHICK,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN EATEN,MADE W/ OIL	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made w	POULTRY
24157214	CHICK,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN EATEN, W/ COOK SPRAY	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made w	POULTRY
24157215	CHICK,THIGH,COAT,BKD/FRD,PPD W/SKN, SKIN EATEN, MADE W/O FAT	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating eaten, made w	POULTRY
24157220	CHICK,THICH,BKD/FRD,PPD W/SKN,SKN NOT EATEN,NS TYPE FAT ADD	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, NS	POULTRY
24157221	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,W/SHORTENING	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, mac	POULTRY
24157222	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN, W/ BUTTER	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, mac	POULTRY

FoodCode	Long descrip	Short descrip	GROUPNAME
24157223	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN, MADE W/ OIL	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, mac	POULTRY
24157224	CHIC,THIGH,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,W/COOK SPRAY	Chicken, thigh, coated, baked or fried, prepared with skin, skin/coating not eaten, mac	POULTRY
24157225	CHIC, THIGH, FF, COATED, BAKED/ FRIED, PREP SKIN,NS SKIN EAT	Chicken, thigh, from fast food, coated, baked or fried, prepared with skin, NS as to ski	POULTRY
24157230	CHICK, THIGH, FF, COATED, BAKED OR FRIED, PREP SKIN,SKIN EAT	Chicken, thigh, from fast food, coated, baked or fried, prepared with skin, skin/coating	POULTRY
24157235	CHICK,THIGH,FF,COATED,BAKED/BROILED,PREP SKIN,SKIN NOT EATEN	Chicken, thigh, from fast food, coated, baked or broiled, prepared with skin, skin/coati	POULTRY
24157240	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,NS COAT EATEN, FAT ADDED	Chicken, thigh, coated, baked or fried, prepared skinless, NS as to coating eaten, fat a	POULTRY
24157241	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,NS COAT EATEN, NO FAT ADD	Chicken, thigh, coated, baked or fried, prepared skinless, NS as to coating eaten, fat r	POULTRY
24157250	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,NS TO TYPE FAT	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, NS as to type	POULTRY
24157251	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, W/ SHORTENING	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made with sh	POULTRY
24157252	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,MADE W/ BUTTER	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made with bu	POULTRY
24157253	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT EATEN,MADE W/ OIL	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made with oil	POULTRY
24157254	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, W/ COOK SPRAY	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made with co	POULTRY
24157255	CHICK,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT EATEN, MADE W/O FAT	Chicken, thigh, coated, baked or fried, prepared skinless, coating eaten, made without	POULTRY
24157260	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN,NS TYP FAT	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, NS as to	POULTRY
24157261	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN,W/ SHORTEN	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, made with	POULTRY
24157262	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN, W/ BUTTER	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, made with	POULTRY
24157263	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT NOT EATEN,MADE W/OIL	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, made with	POULTRY
24157264	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,W/COOK SPRAY	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, made with	POULTRY
24157265	CHIC,THIGH,COAT,BKD/FRD,PPD SKNLES,COAT NOT EAT,MADE W/O FAT	Chicken, thigh, coated, baked or fried, prepared skinless, coating not eaten, made with	POULTRY
24160100	CHICKEN, WING, NFS	Chicken, wing, NS as to cooking method, NS as to skin eaten	POULTRY
24160110	CHICKEN, WING, NS AS TO COOKING METHOD, W/ SKIN	Chicken, wing, NS as to cooking method, skin eaten	POULTRY
24160120	CHICKEN, WING, NS AS TO COOKING METHOD, W/O SKIN	Chicken, wing, NS as to cooking method, skin not eaten	POULTRY
24162100	CHICKEN, WING, ROASTED/BROILED/BAKED, NS SKIN	Chicken, wing, roasted, broiled, or baked, NS as to skin eaten	POULTRY
24162110	CHICKEN, WING, ROASTED/BROILED/BAKED, W/ SKIN	Chicken, wing, roasted, broiled, or baked, skin eaten	POULTRY
24162120	CHICKEN, WING, ROASTED/BROILED/BAKED, W/O SKIN	Chicken, wing, roasted, broiled, or baked, skin not eaten	POULTRY
24163100	CHICKEN, WING, STEWED, NS AS TO SKIN	Chicken, wing, stewed, NS as to skin eaten	POULTRY
24163110	CHICKEN, WING, STEWED, W/ SKIN	Chicken, wing, stewed, skin eaten	POULTRY
24163120	CHICKEN, WING, STEWED, W/O SKIN	Chicken, wing, stewed, skin not eaten	POULTRY
24164100	CHIC, WING, FRIED, NO COAT, NS AS TO SKIN EATEN, FAT ADDED	Chicken, wing, fried, no coating, NS as to skin eaten, fat added in cooking	POULTRY
24164101	CHICK, WING, FRIED, NO COAT, NS SKN EATEN, FAT NOT ADDED	Chicken, wing, fried, no coating, NS as to skin eaten, fat not added in cooking	POULTRY
24164110	CHICK, WING, FRIED, NO COAT, SKIN EATEN, NS TYPE FAT ADDED	Chicken, wing, fried, no coating, skin eaten, NS as to type of fat added in cooking	POULTRY
24164111	CHICK, WING, FRIED, NO COAT, SKIN EATEN, MADE WI/ SHORTENING	Chicken, wing, fried, no coating, skin eaten, made with shortening	POULTRY
24164112	CHICKEN, WING, FRIED, NO COATING, SKIN EATEN, MADE W/ BUTTER	Chicken, wing, fried, no coating, skin eaten, made with butter	POULTRY
24164113	CHICKEN, WING, FRIED, NO COATING, SKIN EATEN, MADE WITH OIL	Chicken, wing, fried, no coating, skin eaten, made with oil	POULTRY
24164114	CHICK, WING, FRIED, NO COAT, SKIN EATEN, MADE W/ COOK SPRAY	Chicken, wing, fried, no coating, skin eaten, made with cooking spray	POULTRY
24164115	CHICKEN, WING, FRIED, NO COATING, SKIN EATEN, MADE W/O FAT	Chicken, wing, fried, no coating, skin eaten, made without fat	POULTRY
24164120	CHICK, WING, FRIED, NO COAT, SKIN NOT EATEN, NS TYPE FAT ADD	Chicken, wing, fried, no coating, skin not eaten, NS as to type of fat added in cooking	POULTRY
24164121	CHICK,WING,FRIED,NO COAT, SKIN NOT EATEN, W/ SHORTENING	Chicken, wing, fried, no coating, skin not eaten, made with shortening	POULTRY
24164122	CHICK,WING,FRIED,NO COAT, SKIN NOT EATEN, MADE W/ BUTTER	Chicken, wing, fried, no coating, skin not eaten, made with butter	POULTRY
24164123	CHICKEN, WING, FRIED, NO COAT, SKIN NOT EATEN, MADE W/ OIL	Chicken, wing, fried, no coating, skin not eaten, made with oil	POULTRY
24164124	CHICKEN, WING, FRIED, NO COATING, W/O SKIN, W/ COOKING SPRAY	Chicken, wing, fried, no coating, skin not eaten, made with cooking spray	POULTRY
24164125	CHICKEN, WING, FRIED, NO COATING, W/O SKIN, MADE W/O FAT	Chicken, wing, fried, no coating, skin not eaten, made without fat	POULTRY
24167100	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,NS SKN EATEN, FAT ADDED	Chicken, wing, coated, baked or fried, prepared with skin, NS as to skin/coating eaten	POULTRY
24167101	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,NS SKN EATEN, FAT NOT ADDED	Chicken, wing, coated, baked or fried, prepared with skin, NS as to skin/coating eaten	POULTRY
24167110	CHIC,WING,COAT,BKD/FRD,PPD W/ SKN,SKN EATEN,NS TYP FAT ADDED	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, NS as to	POULTRY
24167111	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN EATEN, W/ SHORTENING	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made wi	POULTRY
24167112	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN EATEN,MADE W/ BUTTER	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made wi	POULTRY
24167113	CHICKEN,WING,COATED,BKD/FRD,PPD W/SKIN, SKIN EATEN, W/ OIL	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made wi	POULTRY
24167114	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN EATEN, W/ COOK SPRAY	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made wi	POULTRY
24167115	CHICKEN,WING,COATED,BKD/FRD,PPD W/SKIN, SKIN EATEN, W/O FAT	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating eaten, made wi	POULTRY
24167119	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN, MADE W/O FAT	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, mad	POULTRY
24167120	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,NS TYP FAT AD	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, NS a	POULTRY
24167121	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,W/ SHORTENING	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, mad	POULTRY
24167122	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,MADE W/BUTTER	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, mad	POULTRY
24167123	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN, MADE W/ OIL	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, mad	POULTRY
24167124	CHIC,WING,COAT,BKD/FRD,PPD W/SKN,SKN NOT EATEN,W/ COOK SPRAY	Chicken, wing, coated, baked or fried, prepared with skin, skin/coating not eaten, mad	POULTRY
24167125	CHIC, WING, FF, COATED, BAKED/FRIED, PREP SKIN,NS SKIN EATEN	Chicken, wing, from fast food, coated, baked or fried, prepared with skin, NS as to ski	POULTRY
24167130	CHIC, WING, FF, COATED, BAKED/FRIED, PREP SKIN, SKIN EATEN	Chicken, wing, from fast food, coated, baked or fried, prepared with skin, skin/coating	POULTRY
24167135	CHIC, WING, FF, COATED,BAKED/FRIED, PREP SKIN, SKIN NO EATEN	Chicken, wing, from fast food, coated, baked or fried, prepared with skin, skin/coating	POULTRY
24170200	CHICKEN, BACK	Chicken, back	POULTRY
24180200	CHICKEN, NECK OR RIBS, NFS	Chicken, neck or ribs	POULTRY
24198340	CHICKEN TAIL	Chicken, tail	POULTRY
24198440	CHICKEN SKIN	Chicken skin	POULTRY
24198500	CHICKEN FEET	Chicken feet	POULTRY
24198570	CHICKEN, CANNED, MEAT ONLY, LIGHT & DARK MEAT	Chicken, canned, meat only	POULTRY
24198670	CHICKEN ROLL, ROASTED, LIGHT & DARK MEAT	Chicken, chicken roll, roasted	POULTRY
24198690	CHICKEN PATTY, FILLET, OR TENDERS, BREADED, COOKED, FAST FD	Chicken patty, fillet, or tenders, breaded, cooked, from fast food / restaurant	POULTRY
24198695	CHICKEN PATTY, FILLET, TENDERS, BREADED, COOKED, SCH LUNCH	Chicken patty, fillet, or tenders, breaded, cooked, from school lunch	POULTRY
24198700	CHICKEN PATTY/FILLET/TENDERS, BREADED, COOKED	Chicken patty, fillet, or tenders, breaded, cooked	POULTRY
24198710	CHICKEN PATTY W/ CHEESE, BREADED, COOKED	Chicken patty with cheese, breaded, cooked	POULTRY
24198720	CHICKEN, GROUND	Chicken, ground	POULTRY
24198730	CHICKEN NUGGETS, FROM FAST FOOD / RESTAURANT	Chicken nuggets, from fast food / restaurant	POULTRY
24198735	CHICKEN NUGGETS, FROM SCHOOL LUNCH	Chicken nuggets, from school lunch	POULTRY
24198740	CHICKEN NUGGETS	Chicken nuggets	POULTRY
24198840	FRIED CHICKEN CHUNKS, P. R. (CHICHARRONES DE POLLO)	Fried chicken chunks, Puerto Rican style (Chicharrones de pollo)	POULTRY
24201000	TURKEY, NFS	Turkey, NFS	POULTRY
24201010	TURKEY, LIGHT MEAT, COOKED, NS AS TO SKIN	Turkey, light meat, cooked, NS as to skin eaten	POULTRY
24201020	TURKEY, LIGHT MEAT, COOKED, W/O SKIN	Turkey, light meat, cooked, skin not eaten	POULTRY
24201030	TURKEY, LIGHT MEAT, COOKED, W/ SKIN	Turkey, light meat, cooked, skin eaten	POULTRY
24201050	TURKEY, LIGHT, BREADED, BAKED/FRIED, NS AS TO SKIN	Turkey, light meat, breaded, baked or fried, NS as to skin eaten	POULTRY
24201060	TURKEY, LIGHT MEAT, BREADED, BAKED/FRIED, W/O SKIN	Turkey, light meat, breaded, baked or fried, skin not eaten	POULTRY
24201070	TURKEY, LIGHT MEAT, BREADED, BAKED/FRIED, W/ SKIN	Turkey, light meat, breaded, baked or fried, skin eaten	POULTRY
24201110	TURKEY, LIGHT MEAT, ROASTED, NS AS TO SKIN	Turkey, light meat, roasted, NS as to skin eaten	POULTRY
24201120	TURKEY, LIGHT MEAT, ROASTED, W/O SKIN	Turkey, light meat, roasted, skin not eaten	POULTRY
24201130	TURKEY, LIGHT MEAT, ROASTED, W/ SKIN	Turkey, light meat, roasted, skin eaten	POULTRY
24201210	TURKEY, DARK MEAT, ROASTED, NS AS TO SKIN	Turkey, dark meat, roasted, NS as to skin eaten	POULTRY
24201220	TURKEY, DARK MEAT, ROASTED, W/O SKIN	Turkey, dark meat, roasted, skin not eaten	POULTRY
24201230	TURKEY, DARK MEAT, ROASTED, W/ SKIN	Turkey, dark meat, roasted, skin eaten	POULTRY
24201310	TURKEY, LIGHT & DARK MEAT, ROASTED, NS AS TO SKIN	Turkey, light and dark meat, roasted, NS as to skin eaten	POULTRY
24201320	TURKEY, LIGHT & DARK MEAT, ROASTED, W/O SKIN	Turkey, light and dark meat, roasted, skin not eaten	POULTRY
24201330	TURKEY, LIGHT & DARK MEAT, ROASTED, W/ SKIN	Turkey, light and dark meat, roasted, skin eaten	POULTRY
24201350	TURKEY, LT/DK MEAT, BATTERED, FRIED, NS AS TO SKIN	Turkey, light or dark meat, battered, fried, NS as to skin eaten	POULTRY
24201360	TURKEY, LIGHT/DARK MEAT, BATTERED, FRIED, W/O SKIN	Turkey, light or dark meat, battered, fried, skin not eaten	POULTRY
24201370	TURKEY, LIGHT/DARK MEAT, BATTERED, FRIED, W/ SKIN	Turkey, light or dark meat, battered, fried, skin eaten	POULTRY
24201400	TURKEY, LIGHT/DARK MEAT, STEWED, NS AS TO SKIN	Turkey, light or dark meat, stewed, NS as to skin eaten	POULTRY
24201410	TURKEY, LIGHT/DARK MEAT, STEWED, W/O SKIN	Turkey, light or dark meat, stewed, skin not eaten	POULTRY
24201420	TURKEY, LIGHT/DARK MEAT, STEWED, W/ SKIN	Turkey light or dark meat, stewed, skin eaten	POULTRY
24201500	TURKEY, SMOKED, NS AS TO SKIN	Turkey, light or dark meat, smoked, cooked, NS as to skin eaten	POULTRY
24201510	TURKEY, SMOKED, SKIN EATEN	Turkey, light or dark meat, smoked, cooked, skin eaten	POULTRY
24201520	TURKEY, SMOKED, SKIN NOT EATEN	Turkey, light or dark meat, smoked, cooked, skin not eaten	POULTRY
24202000	TURKEY, DRUMSTICK, COOKED, NS AS TO SKIN	Turkey, drumstick, cooked, NS as to skin eaten	POULTRY
24202010	TURKEY, DRUMSTICK, COOKED, W/O SKIN	Turkey, drumstick, cooked, skin not eaten	POULTRY
24202020	TURKEY, DRUMSTICK, COOKED, W/ SKIN	Turkey, drumstick, cooked, skin eaten	POULTRY
24202050	TURKEY, DRUMSTICK, ROASTED, NS AS TO SKIN	Turkey, drumstick, roasted, NS as to skin eaten	POULTRY
24202060	TURKEY, DRUMSTICK, ROASTED, W/O SKIN	Turkey, drumstick, roasted, skin not eaten	POULTRY
24202070	TURKEY, DRUMSTICK, ROASTED, W/ SKIN	Turkey, drumstick, roasted, skin eaten	POULTRY
24202120	TURKEY, DRUMSTICK, SMOKED, SKIN EATEN	Turkey, drumstick, smoked, cooked, skin eaten	POULTRY
24202450	TURKEY, THIGH, COOKED, NS AS TO SKIN	Turkey, thigh, cooked, NS as to skin eaten	POULTRY
24202460	TURKEY, THIGH, COOKED, W/ SKIN	Turkey, thigh, cooked, skin eaten	POULTRY
24202500	TURKEY, THIGH, COOKED, W/O SKIN	Turkey, thigh, cooked, skin not eaten	POULTRY
24202600	TURKEY, NECK, COOKED	Turkey, neck, cooked	POULTRY
24203000	TURKEY, WING, COOKED, NS AS TO SKIN	Turkey, wing, cooked, NS as to skin eaten	POULTRY
24203010	TURKEY, WING, COOKED, W/O SKIN	Turkey, wing, cooked, skin not eaten	POULTRY
24203020	TURKEY, WING, COOKED, W/ SKIN	Turkey, wing, cooked, skin eaten	POULTRY
24203120	TURKEY, WING, SMOKED, COOKED, SKIN EATEN	Turkey, wing, smoked, cooked, skin eaten	POULTRY
24205000	TURKEY, TAIL, COOKED	Turkey, tail, cooked	POULTRY

FoodCode	Long descrip	Short descrip	GROUPNAME
24205100	TURKEY, BACK, COOKED	Turkey, back, cooked	POULTRY
24206000	TURKEY, CANNED	Turkey, canned	POULTRY
24207000	TURKEY, GROUND	Turkey, ground	POULTRY
24208000	TURKEY NUGGETS	Turkey, nuggets	POULTRY
24208500	TURKEY BACON, COOKED	Turkey bacon, cooked	POULTRY
24208510	TURKEY BACON, REDUCED SODIUM, COOKED	Turkey bacon, reduced sodium, cooked	POULTRY
24300100	DUCK, COOKED, NS AS TO SKIN	Duck, cooked, NS as to skin eaten	POULTRY
24300110	DUCK, COOKED, W/ SKIN	Duck, cooked, skin eaten	POULTRY
24300120	DUCK, COOKED, W/O SKIN	Duck, cooked, skin not eaten	POULTRY
24301000	DUCK, ROASTED, NS AS TO SKIN	Duck, roasted, NS as to skin eaten	POULTRY
24301010	DUCK, ROASTED, W/ SKIN	Duck, roasted, skin eaten	POULTRY
24301020	DUCK, ROASTED, W/O SKIN	Duck, roasted, skin not eaten	POULTRY
24301210	DUCK, BATTERED, FRIED	Duck, battered, fried	POULTRY
24302010	DUCK, PRESSED, CHINESE	Duck, pressed, Chinese	POULTRY
25110120	BEEF LIVER, BRAISED	Beef liver, braised	LIVER
25110140	BEEF LIVER, FRIED	Beef liver, fried	LIVER
25110420	CHICKEN LIVER, BRAISED	Chicken liver, braised	LIVER
25110450	CHICKEN LIVER, FRIED	Chicken liver, fried	LIVER
25112200	LIVER PASTE OR PATE, CHICKEN (INCLUDE PATE, NFS)	Liver paste or pate, chicken	LIVER
25210110	FRANKFURTER, WIENER OR HOT DOG, NFS	Frankfurter, wiener, or hot dog, NFS	SAUSAGE
25210150	FRANKFURTER OR HOT DOG, CHEESE-FILLED	Frankfurter or hot dog, cheese-filled	SAUSAGE
25210210	FRANKFURTER OR HOT DOG, BEEF	Frankfurter or hot dog, beef	SAUSAGE
25210220	FRANKFURTER OR HOT DOG, BEEF & PORK	Frankfurter or hot dog, beef and pork	SAUSAGE
25210240	FRANFURTER/HOT DOG, BEEF & PORK, LIGHT	Frankfurter or hot dog, beef and pork, reduced fat or light	SAUSAGE
25210250	FRANKFURTER OR HOT DOG, MEAT & POULTRY, FAT FREE	Frankfurter or hot dog, meat and poultry, fat free	SAUSAGE
25210280	FRANKFURTER OR HOT DOG, MEAT & POULTRY	Frankfurter or hot dog, meat and poultry	SAUSAGE
25210290	FRANKFURTER OR HOT DOG, MEAT & POULTRY, LIGHT	Frankfurter or hot dog, meat and poultry, reduced fat or light	SAUSAGE
25210310	FRANKFURTER OR HOT DOG, CHICKEN	Frankfurter or hot dog, chicken	SAUSAGE
25210410	FRANKFURTER OR HOT DOG, TURKEY	Frankfurter or hot dog, turkey	SAUSAGE
25210620	FRANKFURTER OR HOT DOG, BEEF, REDUCED FAT OR LIGHT	Frankfurter or hot dog, beef, reduced fat or light	SAUSAGE
25210750	FRANKFURTER OR HOT DOG, REDUCED FAT OR LIGHT, NFS	Frankfurter or hot dog, reduced fat or light, NFS	SAUSAGE
25220010	COLD CUT, NFS	Cold cut, NFS	SAUSAGE
25220105	BEEF SAUSAGE	Beef sausage	SAUSAGE
25220106	BEEF SAUSAGE, REDUCED FAT	Beef sausage, reduced fat	SAUSAGE
25220108	BEEF SAUSAGE, REDUCED SODIUM	Beef sausage, reduced sodium	SAUSAGE
25220150	BEEF SAUSAGE WITH CHEESE	Beef sausage with cheese	SAUSAGE
25220210	BLOOD SAUSAGE	Blood sausage	SAUSAGE
25220350	BRATWURST	Bratwurst	SAUSAGE
25220360	BRATWURST W/ CHEESE	Bratwurst, with cheese	SAUSAGE
25220390	BOLOGNA, BEEF, LOW FAT	Bologna, beef, lowfat	SAUSAGE
25220400	BOLOGNA, PORK AND BEEF	Bologna, pork and beef	SAUSAGE
25220410	BOLOGNA, NFS	Bologna, NFS	SAUSAGE
25220420	BOLOGNA, LEBANON	Bologna, Lebanon	SAUSAGE
25220430	BOLOGNA, BEEF	Bologna, beef	SAUSAGE
25220440	BOLOGNA, TURKEY	Bologna, turkey	SAUSAGE
25220450	BOLOGNA RING, SMOKED	Bologna ring, smoked	SAUSAGE
25220460	BOLOGNA, PORK	Bologna, pork	SAUSAGE
25220470	BOLOGNA, BEEF, LOWER SODIUM	Bologna, beef, lower sodium	SAUSAGE
25220480	BOLOGNA, CHICKEN, BEEF, & PORK	Bologna, chicken, beef, and pork	SAUSAGE
25220490	BOLOGNA, W/ CHEESE	Bologna, with cheese	SAUSAGE
25220500	BOLOGNA, BEEF & PORK, LOWFAT	Bologna, beef and pork, lowfat	SAUSAGE
25220510	CAPICOLA	Capicola	SAUSAGE
25220650	TURKEY OR CHICKEN AND BEEF SAUSAGE	Turkey or chicken and beef sausage	SAUSAGE
25220710	CHORIZO	Chorizo	SAUSAGE
25220910	HEAD CHEESE	Head cheese	SAUSAGE
25221110	KNOCKWURST	Knockwurst	SAUSAGE
25221210	MORTADELLA	Mortadella	SAUSAGE
25221250	PEPPERONI	Pepperoni	SAUSAGE
25221310	POLISH SAUSAGE	Polish sausage	SAUSAGE
25221350	ITALIAN SAUSAGE	Italian sausage	SAUSAGE
25221400	SAUSAGE (NOT COLD CUT), NFS	Sausage (not cold cut), NFS	SAUSAGE
25221405	PORK SAUSAGE	Pork sausage	SAUSAGE
25221406	PORK SAUSAGE, REDUCED FAT	Pork sausage, reduced fat	SAUSAGE
25221408	PORK SAUSAGE, REDUCED SODIUM	Pork sausage, reduced sodium	SAUSAGE
25221450	PORK SAUSAGE RICE LINKS	Pork sausage rice links	SAUSAGE
25221460	PORK & BEEF SAUSAGE	Pork and beef sausage	SAUSAGE
25221500	SALAMI, NFS	Salami, NFS	SAUSAGE
25221510	SALAMI, SOFT, COOKED	Salami, soft, cooked	SAUSAGE
25221520	SALAMI, DRY OR HARD	Salami, dry or hard	SAUSAGE
25221530	SALAMI, BEEF	Salami, beef	SAUSAGE
25221610	SCRAPPLE, COOKED	Scrapple, cooked	SAUSAGE
25221710	SOUSE	Souse	SAUSAGE
25221810	THURINGER (INCLUDE SUMMER SAUSAGE)	Thuringer	SAUSAGE
25221830	TURKEY OR CHICKEN SAUSAGE	Turkey or chicken sausage	SAUSAGE
25221855	TURKEY OR CHICKEN SAUSAGE, REDUCED SODIUM	Turkey or chicken sausage, reduced sodium	SAUSAGE
25221860	TURKEY OR CHICKEN SAUSAGE, REDUCED FAT	Turkey or chicken sausage, reduced fat	SAUSAGE
25221870	TURKEY AND PORK SAUSAGE	Turkey or chicken and pork sausage	SAUSAGE
25221875	TURKEY OR CHICKEN, PORK, AND BEEF SAUSAGE, REDUCED SODIUM	Turkey or chicken, pork, and beef sausage, reduced sodium	SAUSAGE
25221910	VIENNA SAUSAGE, CANNED	Vienna sausage, canned	SAUSAGE
25221950	PICKLED SAUSAGE	Pickled sausage	SAUSAGE
25230110	LUNCHEON MEAT, NFS	Luncheon meat, NFS	HAM
25230210	HAM, SLICED, PREPACKAGED OR DELI, LUNCHEON MEAT	Ham, sliced, prepackaged or deli, luncheon meat	HAM
25230220	HAM, SLICED, LOW SALT, PREPACKAGED/DELI, LUNCH MEAT	Ham, sliced, low salt, prepackaged or deli, luncheon meat	HAM
25230230	HAM, SLICED, EXTRA LEAN, PREPACKAGED/DELI	Ham, sliced, extra lean, prepackaged or deli, luncheon meat	HAM
25230235	HAM, SLICED, EXTRA LEAN, LOWER SODIUM, PREPACKAGED OR DELI	Ham, sliced, extra lean, lower sodium, prepackaged or deli, luncheon meat	HAM
25230310	CHICKEN/TURKEY LOAF, PREPACK/DELI, LUNCHEON MEAT	Chicken or turkey loaf, prepackaged or deli, luncheon meat	HAM
25230410	HAM LOAF, LUNCHEON MEAT	Ham loaf, luncheon meat	HAM
25230430	HAM & CHEESE LOAF	Ham and cheese loaf	HAM
25230450	HONEY LOAF	Honey loaf	HAM
25230510	HAM,LUNCH MEAT,CHOP,MINCED,PRESSD,MINCED,NOT CANNED	Ham, luncheon meat, chopped, minced, pressed, spiced, not canned	HAM
25230520	HAM, LUNCHEON MEAT, CHOPPED, SPICED,LOWFAT, NOT CAN	Ham, luncheon meat, chopped, minced, pressed, spiced, lowfat, not canned	HAM
25230530	HAM/PORK , LUNCHEON MEAT, CHOPPED, CAN (INCL SPAM)	Ham and pork, luncheon meat, chopped, minced, pressed, spiced, canned	HAM
25230540	HAM, PORK & CHICKEN, LUNCHEON MEAT, CHOPPED, CANNED	Ham, pork and chicken, luncheon meat, chopped, minced, pressed, spiced, canned	HAM
25230550	HAM, PORK & CHICKEN, LUNCHEON MEAT, CHOPPED, CAN, RED SODIUM	Ham, pork, and chicken, luncheon meat, chopped, minced, pressed, spiced, canned, r	HAM
25230560	LIVERWURST	Liverwurst	HAM
25230790	TURKEY HAM, SLICED, XTRA LEAN, PKG'D, DELI	Turkey ham, sliced, extra lean, prepackaged or deli, luncheon meat	POULTRY
25230800	TURKEY HAM	Turkey ham	POULTRY
25230820	TURKEY PASTRAMI	Turkey pastrami	POULTRY
25230840	TURKEY SALAMI	Turkey salami	POULTRY
25230900	TURKEY OR CHICKEN BREAST, PKG'D/DELI, LUNCHEON MEAT	Turkey or chicken breast, prepackaged or deli, luncheon meat	POULTRY
25230905	TURKEY/CHICKEN BREAST, LOW SALT, PREPACK/DELI, LUNCHEON MEAT	Turkey or chicken breast, low salt, prepackaged or deli, luncheon meat	POULTRY
25231110	BEEF, SLICED, PREPACKAGED/DELI, LUNCHEON MEAT	Beef, sliced, prepackaged or deli, luncheon meat	BEEF
25231150	CORNED BEEF, PRESSED	Corned beef, pressed	BEEF
26100100	FISH, NS AS TO TYPE, RAW	Fish, NS as to type, raw	FISH
26100110	FISH, COOKED, NS AS TO TYPE & COOKING METHOD	Fish, NS as to type, cooked, NS as to cooking method	FISH
26100120	FISH, NS AS TO TYPE, BAKED OR BROILED, MADE WITH OIL	Fish, NS as to type, baked or broiled, made with oil	FISH
26100121	FISH, NS AS TO TYPE, BAKED OR BROILED, MADE WITH BUTTER	Fish, NS as to type, baked or broiled, made with butter	FISH
26100122	FISH, NS AS TO TYPE, BAKED OR BROILED, MADE WITH MARGARINE	Fish, NS as to type, baked or broiled, made with margarine	FISH
26100123	FISH, NS AS TO TYPE, BAKED OR BROILED, MADE WITHOUT FAT	Fish, NS as to type, baked or broiled, made without fat	FISH
26100124	FISH, NS AS TO TYPE, BAKED OR BROILED, MADE W/COOKING SPRAY	Fish, NS as to type, baked or broiled, made with cooking spray	FISH
26100130	FISH, NS AS TO TYPE, COATED, BAKED, MADE WITH OIL	Fish, NS as to type, coated, baked or broiled, made with oil	FISH
26100131	FISH, NS AS TO TYPE, COATED, BAKED OR BROILED,W/ BUTTER	Fish, NS as to type, coated, baked or broiled, made with butter	FISH
26100132	FISH, NS AS TO TYPE, COATED, BAKED OR BROILED, W/MARGARINE	Fish, NS as to type, coated, baked or broiled, made with margarine	FISH
26100133	FISH, NS AS TO TYPE, COATED, BAKED OR BROILED, W/OUT FAT	Fish, NS as to type, coated, baked or broiled, made without fat	FISH
26100134	FISH, NS AS TO TYPE, COATED, BAKED/ BROILED, W/COOKING SPRAY	Fish, NS as to type, coated, baked or broiled, made with cooking spray	FISH
26100140	FISH, NS AS TO TYPE, COATED, FRIED, MADE WITH OIL	Fish, NS as to type, coated, fried, made with oil	FISH

FoodCode	Long descrip	Short descrip	GROUPNAME
26100141	FISH, NS AS TO TYPE, COATED, FRIED, MADE WITH BUTTER	Fish, NS as to type, coated, fried, made with butter	FISH
26100142	FISH, NS AS TO TYPE, COATED, FRIED, MADE WITH MARGARINE	Fish, NS as to type, coated, fried, made with margarine	FISH
26100143	FISH, NS AS TO TYPE, COATED, FRIED, MADE WITHOUT FAT	Fish, NS as to type, coated, fried, made without fat	FISH
26100144	FISH, NS AS TO TYPE, COATED, MADE WITH COOKING SPRAY	Fish, NS as to type, coated, fried, made with cooking spray	FISH
26100160	FISH, NS AS TO TYPE, STEAMED	Fish, NS as to type, steamed	FISH
26100170	FISH, NS AS TO TYPE, DRIED	Fish, NS as to type, dried	FISH
26100180	FISH, NS AS TO TYPE, CANNED	Fish, NS as to type, canned	FISH
26100190	FISH, NS AS TO TYPE, SMOKED	Fish, NS as to type, smoked	FISH
26100200	FISH, NS AS TO TYPE, FROM FAST FOOD	Fish, NS as to type, from fast food	FISH
26100260	FISH STICK, PATTY OR NUGGET FROM FAST FOOD	Fish stick, patty or nugget from fast food	FISH
26100270	FISH STICK, PATTY OR NUGGET FROM RESTAURANT, HOME, OR OTHER	Fish stick, patty or nugget from restaurant, home, or other place	FISH
26101110	ANCHOVY, COOKED, NS AS TO COOKING METHOD	Anchovy, cooked, NS as to cooking method	FISH
26101180	ANCHOVY, CANNED	Anchovy, canned	FISH
26103110	BARRACUDA, COOKED, NS AS TO COOKING METHOD	Barracuda, cooked, NS as to cooking method	FISH
26103120	BARRACUDA, BAKED OR BROILED, FAT ADDED IN COOKING	Barracuda, baked or broiled, fat added in cooking	FISH
26103121	BARRACUDA, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Barracuda, baked or broiled, fat not added in cooking	FISH
26103130	BARRACUDA, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Barracuda, coated, baked or broiled, fat added in cooking	FISH
26103131	BARRACUDA, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKIN	Barracuda, coated, baked or broiled, fat not added in cooking	FISH
26103140	BARRACUDA, COATED, FRIED	Barracuda, coated, fried	FISH
26103160	BARRACUDA, STEAMED OR POACHED	Barracuda, steamed or poached	FISH
26105110	CARP, COOKED, NS AS TO COOKING METHOD	Carp, cooked, NS as to cooking method	FISH
26105120	CARP, BAKED OR BROILED, FAT ADDED IN COOKING	Carp, baked or broiled, fat added in cooking	FISH
26105121	CARP, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Carp, baked or broiled, fat not added in cooking	FISH
26105130	CARP, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Carp, coated, baked or broiled, fat added in cooking	FISH
26105131	CARP, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Carp, coated, baked or broiled, fat not added in cooking	FISH
26105140	CARP, COATED, FRIED	Carp, coated, fried	FISH
26105160	CARP, STEAMED OR POACHED	Carp, steamed or poached	FISH
26105190	CARP, SMOKED	Carp, smoked	FISH
26107110	CATFISH, COOKED, NS AS TO COOKING METHOD	Catfish, cooked, NS as to cooking method	FISH
26107120	CATFISH, BAKED OR BROILED, MADE WITH OIL	Catfish, baked or broiled, made with oil	FISH
26107121	CATFISH, BAKED OR BROILED, MADE WITH BUTTER	Catfish, baked or broiled, made with butter	FISH
26107122	CATFISH, BAKED OR BROILED, MADE WITH MARGARINE	Catfish, baked or broiled, made with margarine	FISH
26107123	CATFISH, BAKED OR BROILED, MADE WITHOUT FAT	Catfish, baked or broiled, made without fat	FISH
26107124	CATFISH, BAKED OR BROILED, MADE WITH COOKING SPRAY	Catfish, baked or broiled, made with cooking spray	FISH
26107130	CATFISH, COATED, BAKED OR BROILED, MADE WITH OIL	Catfish, coated, baked or broiled, made with oil	FISH
26107131	CATFISH, COATED, BAKED OR BROILED, MADE WITH BUTTER	Catfish, coated, baked or broiled, made with butter	FISH
26107132	CATFISH, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Catfish, coated, baked or broiled, made with margarine	FISH
26107133	CATFISH, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Catfish, coated, baked or broiled, made without fat	FISH
26107134	CATFISH, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Catfish, coated, baked or broiled, made with cooking spray	FISH
26107140	CATFISH, COATED, FRIED, MADE WITH OIL	Catfish, coated, fried, made with oil	FISH
26107141	CATFISH, COATED, FRIED, MADE WITH BUTTER	Catfish, coated, fried, made with butter	FISH
26107142	CATFISH, COATED, FRIED, MADE WITH MARGARINE	Catfish, coated, fried, made with margarine	FISH
26107143	CATFISH, COATED, FRIED, MADE WITHOUT FAT	Catfish, coated, fried, made without fat	FISH
26107144	CATFISH, COATED, FRIED, MADE WITH COOKING SPRAY	Catfish, coated, fried, made with cooking spray	FISH
26107160	CATFISH, STEAMED OR POACHED	Catfish, steamed or poached	FISH
26109110	COD, COOKED, NS AS TO COOKING METHOD	Cod, cooked, NS as to cooking method	FISH
26109120	COD, BAKED OR BROILED, MADE WITH OIL	Cod, baked or broiled, made with oil	FISH
26109121	COD, BAKED OR BROILED, MADE WITH BUTTER	Cod, baked or broiled, made with butter	FISH
26109122	COD, BAKED OR BROILED, MADE WITH MARGARINE	Cod, baked or broiled, made with margarine	FISH
26109123	COD, BAKED OR BROILED, MADE WITHOUT FAT	Cod, baked or broiled, made without fat	FISH
26109124	COD, BAKED OR BROILED, MADE WITH COOKING SPRAY	Cod, baked or broiled, made with cooking spray	FISH
26109130	COD, COATED, BAKED OR BROILED, MADE WITH OIL	Cod, coated, baked or broiled, made with oil	FISH
26109131	COD, COATED, BAKED OR BROILED, MADE WITH BUTTER	Cod, coated, baked or broiled, made with butter	FISH
26109132	COD, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Cod, coated, baked or broiled, made with margarine	FISH
26109133	COD, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Cod, coated, baked or broiled, made without fat	FISH
26109134	COD, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Cod, coated, baked or broiled, made with cooking spray	FISH
26109140	COD, COATED, FRIED, MADE WITH OIL	Cod, coated, fried, made with oil	FISH
26109141	COD, COATED, FRIED, MADE WITH BUTTER	Cod, coated, fried, made with butter	FISH
26109142	COD, COATED, FRIED, MADE WITH MARGARINE	Cod, coated, fried, made with margarine	FISH
26109143	COD, COATED, FRIED, MADE WITHOUT FAT	Cod, coated, fried, made without fat	FISH
26109144	COD, COATED, FRIED, MADE WITH COOKING SPRAY	Cod, coated, fried, made with cooking spray	FISH
26109160	COD, STEAMED OR POACHED	Cod, steamed or poached	FISH
26109170	COD, DRIED, SALTED	Cod, dried, salted	FISH
26109180	COD, DRIED, SALTED, SALT REMOVED IN WATER	Cod, dried, salted, salt removed in water	FISH
26109190	COD, SMOKED	Cod, smoked	FISH
26111110	CROAKER, COOKED, NS AS TO COOKING METHOD	Croaker, cooked, NS as to cooking method	FISH
26111120	CROAKER, BAKED OR BROILED, FAT ADDED IN COOKING	Croaker, baked or broiled, fat added in cooking	FISH
26111121	CROAKER, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Croaker, baked or broiled, fat not added in cooking	FISH
26111130	CROAKER, COATED, BAKED, FAT ADDED IN COOKING	Croaker, coated, baked or broiled, fat added in cooking	FISH
26111131	CROAKER, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Croaker, coated, baked or broiled, fat not added in cooking	FISH
26111140	CROAKER, COATED, FRIED	Croaker, coated, fried	FISH
26111160	CROAKER, STEAMED OR POACHED	Croaker, steamed or poached	FISH
26113110	EEL, COOKED, NS AS TO COOKING METHOD	Eel, cooked, NS as to cooking method	FISH
26113160	EEL, STEAMED OR POACHED	Eel, steamed or poached	FISH
26113190	EEL, SMOKED	Eel, smoked	FISH
26115000	FLOUNDER, RAW	Flounder, raw	FISH
26115110	FLOUNDER, COOKED, NS AS TO COOKING METHOD	Flounder, cooked, NS as to cooking method	FISH
26115120	FLOUNDER, BAKED OR BROILED, MADE WTIH OIL	Flounder, baked or broiled, made with oil	FISH
26115121	FLOUNDER, BAKED OR BROILED, MADE WITH BUTTER	Flounder, baked or broiled, made with butter	FISH
26115122	FLOUNDER, BAKED OR BROILED, MADE WITH MARGARINE	Flounder, baked or broiled, made with margarine	FISH
26115123	FLOUNDER, BAKED OR BROILED, MADE WITHOUT FAT	Flounder, baked or broiled, made without fat	FISH
26115124	FLOUNDER, BAKED OR BROILED, MADE WITH COOKING SPRAY	Flounder, baked or broiled, made with cooking spray	FISH
26115130	FLOUNDER, COATED, BAKED OR BROILED, MADE WITH OIL	Flounder, coated, baked or broiled, made with oil	FISH
26115131	FLOUNDER, COATED, BAKED OR BROILED, MADE WITH BUTTER	Flounder, coated, baked or broiled, made with butter	FISH
26115132	FLOUNDER, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Flounder, coated, baked or broiled, made with margarine	FISH
26115133	FLOUNDER, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Flounder, coated, baked or broiled, made without fat	FISH
26115134	FLOUNDER, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Flounder, coated, baked or broiled, made with cooking spray	FISH
26115140	FLOUNDER, COATED, FRIED, MADE WITH OIL	Flounder, coated, fried, made with oil	FISH
26115141	FLOUNDER, COATED, FRIED, MADE WITH BUTTER	Flounder, coated, fried, made with butter	FISH
26115142	FLOUNDER, COATED, FRIED, MADE WITH MARGARINE	Flounder, coated, fried, made with margarine	FISH
26115143	FLOUNDER, COATED, FRIED, MADE WITHOUT FAT	Flounder, coated, fried, made without fat	FISH
26115144	FLOUNDER, COATED, FRIED, MADE WITH COOKING SPRAY	Flounder, coated, fried, made with cooking spray	FISH
26115160	FLOUNDER, STEAMED OR POACHED	Flounder, steamed or poached	FISH
26115190	FLOUNDER, SMOKED	Flounder, smoked	FISH
26117110	HADDOCK, COOKED, NS AS TO COOKING METHOD	Haddock, cooked, NS as to cooking method	FISH
26117120	HADDOCK, BAKED OR BROILED, FAT ADDED IN COOKING	Haddock, baked or broiled, fat added in cooking	FISH
26117121	HADDOCK, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Haddock, baked or broiled, fat not added in cooking	FISH
26117130	HADDOCK, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Haddock, coated, baked or broiled, fat added in cooking	FISH
26117131	HADDOCK, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Haddock, coated, baked or broiled, fat not added in cooking	FISH
26117140	HADDOCK, COATED, FRIED	Haddock, coated, fried	FISH
26117160	HADDOCK, STEAMED OR POACHED	Haddock, steamed or poached	FISH
26117190	HADDOCK, SMOKED	Haddock, smoked	FISH
26118000	HALIBUT, RAW	Halibut, raw	FISH
26118010	HALIBUT, COOKED, NS AS TO COOKING METHOD	Halibut, cooked, NS as to cooking method	FISH
26118020	HALIBUT, BAKED OR BROILED, MADE WITH OIL	Halibut, baked or broiled, made with oil	FISH
26118021	HALIBUT, BAKED OR BROILED, MADE WITH BUTTER	Halibut, baked or broiled, made with butter	FISH
26118022	HALIBUT, BAKED OR BROILED, MADE WITH MARGARINE	Halibut, baked or broiled, made with margarine	FISH
26118023	HALIBUT, BAKED OR BROILED, MADE WITHOUT FAT	Halibut, baked or broiled, made without fat	FISH
26118024	HALIBUT, BAKED OR BROILED, MADE WITH COOKING SPRAY	Halibut, baked or broiled, made with cooking spray	FISH
26118030	HALIBUT, COATED, BAKED OR BROILED, MADE WITH OIL	Halibut, coated, baked or broiled, made with oil	FISH
26118031	HALIBUT, COATED, BAKED OR BROILED, MADE WITH BUTTER	Halibut, coated, baked or broiled, made with butter	FISH
26118032	HALIBUT, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Halibut, coated, baked or broiled, made with margarine	FISH
26118033	HALIBUT, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Halibut, coated, baked or broiled, made without fat	FISH
26118034	HALIBUT, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Halibut, coated, baked or broiled, made with cooking spray	FISH
26118040	HALIBUT, COATED, FRIED, MADE WITH OIL	Halibut, coated, fried, made with oil	FISH
26118041	HALIBUT, COATED, FRIED, MADE WITH BUTTER	Halibut, coated, fried, made with butter	FISH

FoodCode	Long descrip	Short descrip	GROUPNAME
26118042	HALIBUT, COATED, FRIED, MADE WITH MARGARINE	Halibut, coated, fried, made with margarine	FISH
26118043	HALIBUT, COATED, FRIED, MADE WITHOUT FAT	Halibut, coated, fried, made without fat	FISH
26118044	HALIBUT, COATED, FRIED, MADE WITH COOKING SPRAY	Halibut, coated, fried, made with cooking spray	FISH
26118050	HALIBUT, STEAMED OR POACHED	Halibut, steamed or poached	FISH
26118060	HALIBUT, SMOKED	Halibut, smoked	FISH
26119100	HERRING, RAW	Herring, raw	FISH
26119110	HERRING, COOKED, NS AS TO COOKING METHOD	Herring, cooked, NS as to cooking method	FISH
26119120	HERRING, BAKED OR BROILED, FAT ADDED IN COOKING	Herring, baked or broiled, fat added in cooking	FISH
26119121	HERRING, BAKED OR BROILED, FAT NOT USED IN PREPARATION	Herring, baked or broiled, fat not added in cooking	FISH
26119130	HERRING, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Herring, coated, baked or broiled, fat added in cooking	FISH
26119131	HERRING, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Herring, coated, baked or broiled, fat not added in cooking	FISH
26119140	HERRING, COATED, FRIED	Herring, coated, fried	FISH
26119160	HERRING, PICKLED, IN CREAM SAUCE	Herring, pickled, in cream sauce	FISH
26119170	HERRING, DRIED, SALTED	Herring, dried, salted	FISH
26119180	HERRING, PICKLED	Herring, pickled	FISH
26119190	HERRING, SMOKED, KIPPERED	Herring, smoked, kippered	FISH
26121100	MACKEREL, RAW	Mackerel, raw	FISH
26121110	MACKEREL, COOKED, NS AS TO COOKING METHOD	Mackerel, cooked, NS as to cooking method	FISH
26121120	MACKEREL, BAKED OR BROILED, FAT ADDED IN COOKING	Mackerel, baked or broiled, fat added in cooking	FISH
26121121	MACKEREL, BAKED OR BROILED, FAT NOT USED IN PREPARATION	Mackerel, baked or broiled, fat not added in cooking	FISH
26121131	MACKEREL, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Mackerel, coated, baked or broiled, fat added in cooking	FISH
26121132	MACKEREL, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Mackerel, coated, baked or broiled, fat not added in cooking	FISH
26121140	MACKEREL, COATED, FRIED	Mackerel, coated, fried	FISH
26121160	MACKEREL, PICKLED	Mackerel, pickled	FISH
26121180	MACKEREL, CANNED	Mackerel, canned	FISH
26121190	MACKEREL, SMOKED	Mackerel, smoked	FISH
26123100	MULLET, RAW	Mullet, raw	FISH
26123110	MULLET, COOKED, NS AS TO COOKING METHOD	Mullet, cooked, NS as to cooking method	FISH
26123120	MULLET, BAKED OR BROILED, FAT USED IN PREPARATION	Mullet, baked or broiled, fat added in cooking	FISH
26123121	MULLET, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Mullet, baked or broiled, fat not added in cooking	FISH
26123130	MULLET, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Mullet, coated, baked or broiled, fat added in cooking	FISH
26123131	MULLET, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Mullet, coated, baked or broiled, fat not added in cooking	FISH
26123140	MULLET, COATED, FRIED	Mullet, coated, fried	FISH
26123160	MULLET, STEAMED OR POACHED	Mullet, steamed or poached	FISH
26125100	OCEAN PERCH, RAW	Ocean perch, raw	FISH
26125110	OCEAN PERCH, COOKED, NS AS TO COOKING METHOD	Ocean perch, cooked, NS as to cooking method	FISH
26125120	OCEAN PERCH, BAKED OR BROILED, FAT USED IN PREPARATION	Ocean perch, baked or broiled, fat added in cooking	FISH
26125121	OCEAN PERCH, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Ocean perch, baked or broiled, fat not added in cooking	FISH
26125130	OCEAN PERCH, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Ocean perch, coated, baked or broiled, fat added in cooking	FISH
26125131	OCEAN PERCH, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOK	Ocean perch, coated, baked or broiled, fat not added in cooking	FISH
26125140	OCEAN PERCH, COATED, FRIED	Ocean perch, coated, fried	FISH
26125160	OCEAN PERCH, STEAMED OR POACHED	Ocean perch, steamed or poached	FISH
26127110	PERCH, COOKED, NS AS TO COOKING METHOD	Perch, cooked, NS as to cooking method	FISH
26127120	PERCH, BAKED OR BROILED, MADE WITH OIL	Perch, baked or broiled, made with oil	FISH
26127121	PERCH, BAKED OR BROILED, MADE WITH BUTTER	Perch, baked or broiled, made with butter	FISH
26127122	PERCH, BAKED OR BROILED, MADE WITH MARGARINE	Perch, baked or broiled, made with margarine	FISH
26127123	PERCH, BAKED OR BROILED, MADE WITHOUT FAT	Perch, baked or broiled, made without fat	FISH
26127124	PERCH, BAKED OR BROILED, MADE WITH COOKING SPRAY	Perch, baked or broiled, made with cooking spray	FISH
26127130	PERCH, COATED, BAKED OR BROILED, MADE WITH OIL	Perch, coated, baked or broiled, made with oil	FISH
26127131	PERCH, COATED, BAKED OR BROILED, MADE WITH BUTTER	Perch, coated, baked or broiled, made with butter	FISH
26127132	PERCH, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Perch, coated, baked or broiled, made with margarine	FISH
26127133	PERCH, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Perch, coated, baked or broiled, made without fat	FISH
26127134	PERCH, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Perch, coated, baked or broiled, made with cooking spray	FISH
26127140	PERCH, COATED, FRIED	Perch, coated, fried, made with oil	FISH
26127141	PERCH, COATED, FRIED, MADE WITH BUTTER	Perch, coated, fried, made with butter	FISH
26127142	PERCH, COATED, FRIED, MADE WITH MARGARINE	Perch, coated, fried, made with margarine	FISH
26127143	PERCH, COATED, FRIED, MADE WITHOUT FAT	Perch, coated, fried, made without fat	FISH
26127144	PERCH, COATED, FRIED, MADE WITH COOKING SPRAY	Perch, coated, fried, made with cooking spray	FISH
26127160	PERCH, STEAMED OR POACHED	Perch, steamed or poached	FISH
26129110	PIKE, COOKED, NS AS TO COOKING METHOD	Pike, cooked, NS as to cooking method	FISH
26129120	PIKE, BAKED OR BROILED, FAT ADDED IN COOKING	Pike, baked or broiled, fat added in cooking	FISH
26129121	PIKE, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Pike, baked or broiled, fat not added in cooking	FISH
26129130	PIKE, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Pike, coated, baked or broiled, fat added in cooking	FISH
26129131	PIKE, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Pike, coated, baked or broiled, fat not added in cooking	FISH
26129140	PIKE, COATED, FRIED	Pike, coated, fried	FISH
26129160	PIKE, STEAMED OR POACHED	Pike, steamed or poached	FISH
26131100	POMPANO, RAW	Pompano, raw	FISH
26131110	POMPANO, COOKED, NS AS TO COOKING METHOD	Pompano, cooked, NS as to cooking method	FISH
26131120	POMPANO, BAKED OR BROILED, FAT ADDED IN COOKING	Pompano, baked or broiled, fat added in cooking	FISH
26131121	POMPANO, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Pompano, baked or broiled, fat not added in cooking	FISH
26131130	POMPANO, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Pompano, coated, baked or broiled, fat added in cooking	FISH
26131131	POMPANO, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Pompano, coated, baked or broiled, fat not added in cooking	FISH
26131140	POMPANO, COATED, FRIED	Pompano, coated, fried	FISH
26131160	POMPANO, STEAMED OR POACHED	Pompano, steamed or poached	FISH
26131190	POMPANO, SMOKED	Pompano, smoked	FISH
26133100	PORGY, RAW	Porgy, raw	FISH
26133110	PORGY, COOKED, NS AS TO COOKING METHOD	Porgy, cooked, NS as to cooking method	FISH
26133120	PORGY, BAKED OR BROILED, FAT ADDED IN COOKING	Porgy, baked or broiled, fat added in cooking	FISH
26133121	PORGY, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Porgy, baked or broiled, fat not added in cooking	FISH
26133130	PORGY, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Porgy, coated, baked or broiled, fat added in cooking	FISH
26133131	PORGY, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Porgy, coated, baked or broiled, fat not added in cooking	FISH
26133140	PORGY, COATED, FRIED	Porgy, coated, fried	FISH
26133160	PORGY, STEAMED OR POACHED	Porgy, steamed or poached	FISH
26135110	RAY, COOKED, NS AS TO COOKING METHOD	Ray, cooked, NS as to cooking method	FISH
26135120	RAY, BAKED OR BROILED, FAT ADDED IN COOKING	Ray, baked or broiled, fat added in cooking	FISH
26135121	RAY, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Ray, baked or broiled, fat not added in cooking	FISH
26135130	RAY, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Ray, coated, baked or broiled, fat added in cooking	FISH
26135131	RAY, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Ray, coated, baked or broiled, fat not added in cooking	FISH
26135140	RAY, COATED, FRIED	Ray, coated, fried	FISH
26135160	RAY, STEAMED OR POACHED	Ray, steamed or poached	FISH
26137100	SALMON, RAW	Salmon, raw	FISH
26137110	SALMON, COOKED, NS AS TO COOKING METHOD	Salmon, cooked, NS as to cooking method	FISH
26137120	SALMON, BAKED OR BROILED, MADE WITH OIL	Salmon, baked or broiled, made with oil	FISH
26137121	SALMON, BAKED OR BROILED, MADE WITH BUTTER	Salmon, baked or broiled, made with butter	FISH
26137122	SALMON, BAKED OR BROILED, MADE WITH MARGARINE	Salmon, baked or broiled, made with margarine	FISH
26137123	SALMON, BAKED OR BROILED, MADE WITHOUT FAT	Salmon, baked or broiled, made without fat	FISH
26137124	SALMON, BAKED OR BROILED, MADE WITH COOKING SPRAY	Salmon, baked or broiled, made with cooking spray	FISH
26137130	SALMON, COATED, BAKED OR BROILED, MADE WITH OIL	Salmon, coated, baked or broiled, made with oil	FISH
26137131	SALMON, COATED, BAKED OR BROILED, MADE WITH BUTTER	Salmon, coated, baked or broiled, made with butter	FISH
26137132	SALMON, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Salmon, coated, baked or broiled, made with margarine	FISH
26137133	SALMON, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Salmon, coated, baked or broiled, made without fat	FISH
26137134	SALMON, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Salmon, coated, baked or broiled, made with cooking spray	FISH
26137140	SALMON, COATED, FRIED, MADE WITH OIL	Salmon, coated, fried, made with oil	FISH
26137141	SALMON, COATED, FRIED, MADE WITH BUTTER	Salmon, coated, fried, made with butter	FISH
26137142	SALMON, COATED, FRIED, MADE WITH MARGARINE	Salmon, coated, fried, made with margarine	FISH
26137143	SALMON, COATED, FRIED, MADE WITHOUT FAT	Salmon, coated, fried, made without fat	FISH
26137144	SALMON, COATED, FRIED, MADE WITH COOKING SPRAY	Salmon, coated, fried, made with cooking spray	FISH
26137160	SALMON, STEAMED OR POACHED	Salmon, steamed or poached	FISH
26137170	SALMON, DRIED	Salmon, dried	FISH
26137180	SALMON, CANNED	Salmon, canned	FISH
26137190	SALMON, SMOKED (INCLUDE LOX)	Salmon, smoked	FISH
26139110	SARDINES, COOKED	Sardines, cooked	FISH
26139170	SARDINE, DRIED	Sardines, dried	FISH
26139180	SARDINES, CANNED IN OIL	Sardines, canned in oil	FISH
26139190	SARDINES, SKINLESS, BONELESS, PACKED IN WATER	Sardines, skinless, boneless, packed in water	FISH
26141110	SEA BASS, COOKED, NS AS TO COOKING METHOD	Sea bass, cooked, NS as to cooking method	FISH

FoodCode	Long descrip	Short descrip	GROUPNAME
26141120	SEA BASS, BAKED OR BROILED, FAT ADDED IN COOKING	Sea bass, baked or broiled, fat added in cooking	FISH
26141121	SEA BASS, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Sea bass, baked or broiled, fat not added in cooking	FISH
26141130	SEA BASS, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Sea bass, coated, baked or broiled, fat added in cooking	FISH
26141131	SEA BASS, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Sea bass, coated, baked or broiled, fat not added in cooking	FISH
26141140	SEA BASS, COATED, FRIED	Sea bass, coated, fried	FISH
26141160	SEA BASS, STEAMED OR POACHED	Sea bass, steamed or poached	FISH
26141180	SEA BASS, PICKLED (MERO EN ESCABECHE)	Sea bass, pickled (Mero en escabeche)	FISH
26143110	SHARK, COOKED, NS AS TO COOKING METHOD	Shark, cooked, NS as to cooking method	FISH
26143120	SHARK, BAKED OR BROILED, FAT ADDED IN COOKING	Shark, baked or broiled, fat added in cooking	FISH
26143121	SHARK, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Shark, baked or broiled, fat not added in cooking	FISH
26143130	SHARK, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Shark, coated, baked or broiled, fat added in cooking	FISH
26143131	SHARK, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Shark, coated, baked or broiled, fat not added in cooking	FISH
26143140	SHARK, COATED, FRIED	Shark, coated, fried	FISH
26143160	SHARK, STEAMED OR POACHED	Shark, steamed or poached	FISH
26147110	STURGEON, COOKED, NS AS TO COOKING METHOD	Sturgeon, cooked, NS as to cooking method	FISH
26147120	STURGEON, BAKED OR BROILED, FAT ADDED IN COOKING	Sturgeon, baked or broiled, fat added in cooking	FISH
26147130	STURGEON, STEAMED	Sturgeon, steamed	FISH
26147140	STURGEON, COATED, FRIED	Sturgeon, coated, fried	FISH
26147190	STURGEON, SMOKED	Sturgeon, smoked	FISH
26149110	SWORDFISH, COOKED, NS AS TO COOKING METHOD	Swordfish, cooked, NS as to cooking method	FISH
26149120	SWORDFISH, BAKED OR BROILED, FAT ADDED IN COOKING	Swordfish, baked or broiled, fat added in cooking	FISH
26149121	SWORDFISH, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Swordfish, baked or broiled, fat not added in cooking	FISH
26149130	SWORDFISH, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Swordfish, coated, baked or broiled, fat added in cooking	FISH
26149131	SWORDFISH, COATED, BAKED OR BROILED, FAT NOT ADDED IN COOKIN	Swordfish, coated, baked or broiled, fat not added in cooking	FISH
26149140	SWORDFISH, COATED, FRIED	Swordfish, coated, fried	FISH
26149160	SWORDFISH, STEAMED OR POACHED	Swordfish, steamed or poached	FISH
26151110	TROUT, COOKED, NS AS TO COOKING METHOD	Trout, cooked, NS as to cooking method	FISH
26151120	TROUT, BAKED OR BROILED, MADE WITH OIL	Trout, baked or broiled, made with oil	FISH
26151121	TROUT, BAKED OR BROILED, MADE WITH BUTTER	Trout, baked or broiled, made with butter	FISH
26151122	TROUT, BAKED OR BROILED, MADE WITH MARGARINE	Trout, baked or broiled, made with margarine	FISH
26151123	TROUT, BAKED OR BROILED, MADE WITHOUT FAT	Trout, baked or broiled, made without fat	FISH
26151124	TROUT, BAKED OR BROILED, MADE WITH COOKING SPRAY	Trout, baked or broiled, made with cooking spray	FISH
26151130	TROUT, COATED, BAKED OR BROILED, MADE WITH OIL	Trout, coated, baked or broiled, made with oil	FISH
26151131	TROUT, COATED, BAKED OR BROILED, MADE WITH BUTTER	Trout, coated, baked or broiled, made with butter	FISH
26151132	TROUT, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Trout, coated, baked or broiled, made with margarine	FISH
26151133	TROUT, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Trout, coated, baked or broiled, made without fat	FISH
26151134	TROUT, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Trout, coated, baked or broiled, made with cooking spray	FISH
26151140	TROUT, COATED, FRIED, MADE WITH OIL	Trout, coated, fried, made with oil	FISH
26151141	TROUT, COATED, FRIED, MADE WITH BUTTER	Trout, coated, fried, made with butter	FISH
26151142	TROUT, COATED, FRIED, MADE WITH MARGARINE	Trout, coated, fried, made with margarine	FISH
26151143	TROUT, COATED, FRIED, MADE WITHOUT FAT	Trout, coated, fried, made without fat	FISH
26151144	TROUT, COATED, FRIED, MADE WITH COOKING SPRAY	Trout, coated, fried, made with cooking spray	FISH
26151160	TROUT, STEAMED OR POACHED	Trout, steamed or poached	FISH
26151190	TROUT, SMOKED	Trout, smoked	FISH
26153100	TUNA, FRESH, RAW	Tuna, fresh, raw	FISH
26153110	TUNA, FRESH, COOKED, NS AS TO COOKING METHOD	Tuna, fresh, cooked, NS as to cooking method	FISH
26153120	TUNA, FRESH, BAKED OR BROILED, FAT ADDED IN COOKING	Tuna, fresh, baked or broiled, fat added in cooking	FISH
26153122	TUNA, FRESH, BAKED OR BROILED, FAT NOT ADDED IN COOKING	Tuna, fresh, baked or broiled, fat not added in cooking	FISH
26153130	TUNA, FRESH, COATED, BAKED OR BROILED, FAT ADDED IN COOKING	Tuna, fresh, coated, baked or broiled, fat added in cooking	FISH
26153131	TUNA, FRESH, COATED, BAKED OR BROILED, FAT NOT ADDED	Tuna, fresh, coated, baked or broiled, fat not added	FISH
26153140	TUNA, FRESH, COATED, FRIED	Tuna, fresh, coated, fried	FISH
26153160	TUNA, FRESH, STEAMED OR POACHED	Tuna, fresh, steamed or poached	FISH
26153170	TUNA, FRESH, DRIED	Tuna, fresh, dried	FISH
26153190	TUNA, FRESH, SMOKED	Tuna, fresh, smoked	FISH
26155110	TUNA, CANNED, NS AS TO OIL OR WATER PACK	Tuna, canned, NS as to oil or water pack	FISH
26155180	TUNA, CANNED, OIL PACK	Tuna, canned, oil pack	FISH
26155190	TUNA, CANNED, WATER PACK	Tuna, canned, water pack	FISH
26157110	WHITING, COOKED, NS AS TO COOKING METHOD	Whiting, cooked, NS as to cooking method	FISH
26157120	WHITING, BAKED OR BROILED, MADE WITH OIL	Whiting, baked or broiled, made with oil	FISH
26157121	WHITING, BAKED OR BROILED, MADE WITH BUTTER	Whiting, baked or broiled, made with butter	FISH
26157122	WHITING, BAKED OR BROILED, MADE WITH MARGARINE	Whiting, baked or broiled, made with margarine	FISH
26157123	WHITING, BAKED OR BROILED, MADE WITHOUT FAT	Whiting, baked or broiled, made without fat	FISH
26157124	WHITING, BAKED OR BROILED, MADE WITH COOKING SPRAY	Whiting, baked or broiled, made with cooking spray	FISH
26157130	WHITING, COATED, BAKED OR BROILED, MADE WITH OIL	Whiting, coated, baked or broiled, made with oil	FISH
26157131	WHITING, COATED, BAKED OR BROILED, MADE WITH BUTTER	Whiting, coated, baked or broiled, made with butter	FISH
26157132	WHITING, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Whiting, coated, baked or broiled, made with margarine	FISH
26157133	WHITING, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Whiting, coated, baked or broiled, made without fat	FISH
26157134	WHITING, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Whiting, coated, baked or broiled, made with cooking spray	FISH
26157140	WHITING, COATED, FRIED, MADE WITH OIL	Whiting, coated, fried, made with oil	FISH
26157141	WHITING, COATED, FRIED, MADE WITH BUTTER	Whiting, coated, fried, made with butter	FISH
26157142	WHITING, COATED, FRIED, MADE WITH MARGARINE	Whiting, coated, fried, made with margarine	FISH
26157143	WHITING, COATED, FRIED, MADE WITHOUT FAT	Whiting, coated, fried, made without fat	FISH
26157144	WHITING, COATED, FRIED, MADE WITH COOKING SPRAY	Whiting, coated, fried, made with cooking spray	FISH
26157160	WHITING, STEAMED OR POACHED	Whiting, steamed or poached	FISH
26158000	TILAPIA, COOKED, NS AS TO COOKING METHOD	Tilapia, cooked, NS as to cooking method	FISH
26158010	TILAPIA, BAKED OR BROILED, MADE WITH OIL	Tilapia, baked or broiled, made with oil	FISH
26158011	TILAPIA, BAKED OR BROILED, MADE WITH BUTTER	Tilapia, baked or broiled, made with butter	FISH
26158012	TILAPIA, BAKED OR BROILED, MADE WITH MARGARINE	Tilapia, baked or broiled, made with margarine	FISH
26158013	TILAPIA, BAKED OR BROILED, MADE WITHOUT FAT	Tilapia, baked or broiled, made without fat	FISH
26158014	TILAPIA, BAKED OR BROILED, MADE WITH COOKING SPRAY	Tilapia, baked or broiled, made with cooking spray	FISH
26158020	TILAPIA, COATED, BAKED OR BROILED, MADE WITH OIL	Tilapia, coated, baked or broiled, made with oil	FISH
26158021	TILAPIA, COATED, BAKED OR BROILED, MADE WITH BUTTER	Tilapia, coated, baked or broiled, made with butter	FISH
26158022	TILAPIA, COATED, BAKED OR BROILED, MADE WITH MARGARINE	Tilapia, coated, baked or broiled, made with margarine	FISH
26158023	TILAPIA, COATED, BAKED OR BROILED, MADE WITHOUT FAT	Tilapia, coated, baked or broiled, made without fat	FISH
26158024	TILAPIA, COATED, BAKED OR BROILED, MADE WITH COOKING SPRAY	Tilapia, coated, baked or broiled, made with cooking spray	FISH
26158030	TILAPIA, COATED, FRIED, MADE WITH OIL	Tilapia, coated, fried, made with oil	FISH
26158031	TILAPIA, COATED, FRIED, MADE WITH BUTTER	Tilapia, coated, fried, made with butter	FISH
26158032	TILAPIA, COATED, FRIED, MADE WITH MARGARINE	Tilapia, coated, fried, made with margarine	FISH
26158033	TILAPIA, COATED, FRIED, MADE WITHOUT FAT	Tilapia, coated, fried, made without fat	FISH
26158034	TILAPIA, COATED, FRIED, MADE WITH COOKING SPRAY	Tilapia, coated, fried, made with cooking spray	FISH
26158050	TILAPIA, STEAMED OR POACHED	Tilapia, steamed or poached	FISH

GROUP	GROUPNAME	LEVEL	UNIT	NOTES
A	Energy drinks,	1	g/portion	RTD (powders, tablets) including sports drinks
B	Protein bars	1	g/portion	Including breakfast bars
C	Milk Shakes	1	g/portion	Excluding slimming / meal replacement products
D	Protein powders	1	g/portion	Including soy-based
E	Meal replacement	1	g/portion	Powders and bars
F	Meat analogues	1	g/portion	Egg and meat substitutes
G	Dry mix drinks	1	g/portion	Excluding meal replacements and instant coffee

Foodcode	Description	Detail	GROUP
95310200	FULL THROTTLE ENERGY DRINK	Full Throttle Energy Drink	A
95310400	MONSTER ENERGY DRINK	Monster Energy Drink	A
95310500	MOUNTAIN DEW AMP ENERGY DRINK	Mountain Dew AMP Energy Drink	A
95310550	NO FEAR ENERGY DRINK	No Fear Energy Drink	A
95310555	NO FEAR MOTHERLOAD ENERGY DRINK	No Fear Motherload Energy Drink	A
95310560	NOS ENERGY DRINK	NOS Energy Drink	A
95310600	RED BULL ENERGY DRINK	Red Bull Energy Drink	A
95310700	ROCKSTAR ENERGY DRINK	Rockstar Energy Drink	A
95310750	SOBE ENERGIZE ENERGY JUICE DRINK	SoBe Energize Energy Juice Drink	A
95310800	VAULT ENERGY DRINK	Vault Energy Drink	A
95311000	ENERGY DRINK	Energy Drink	A
95312400	MONSTER ENERGY DRINK, LO CARB	Monster Energy Drink, Lo Carb	A
95312500	MOUNTAIN DEW AMP ENERGY DRINK, SUGAR-FREE	Mountain Dew AMP Energy Drink, sugar-free	A
95312550	NO FEAR ENERGY DRINK, SUGAR-FREE	No Fear Energy Drink, sugar-free	A
95312555	NOS ENERGY DRINK, SUGAR-FREE	NOS Energy Drink, sugar-free	A
95312560	CRANBERRY JUICE ENERGY DRINK, HI VIT C & B, W/LOW CAL SWTNR	Ocean Spray Cran-Energy Cranberry Energy Juice Drink	A
95312600	RED BULL ENERGY DRINK, SUGAR-FREE	Red Bull Energy Drink, sugar-free	A
95312700	ROCKSTAR ENERGY DRINK, SUGAR-FREE	Rockstar Energy Drink, sugar-free	A
95312800	VAULT ZERO ENERGY DRINK	Vault Zero Energy Drink	A
95312900	XS ENERGY DRINK	XS Energy Drink	A
95312905	XS GOLD PLUS ENERGY DRINK	XS Gold Plus Energy Drink	A
95313200	ENERGY DRINK, SUGAR FREE	Energy drink, sugar free	A
95320200	GATORADE G SPORTS DRINK	Gatorade G sports drink	A
95320500	POWERADE SPORTS DRINK	Powerade sports drink	A
95321000	SPORTS DRINK, NFS	Sports drink, NFS	A
95322200	GATORADE G2 SPORTS DRINK, LOW CALORIE	Gatorade G2 sports drink, low calorie	A
95322500	POWERADE ZERO SPORTS DRINK, LOW CALORIE	Powerade Zero sports drink, low calorie	A
95323000	SPORTS DRINK, LOW CALORIE	Sports drink, low calorie	A
53710400	FIBER ONE CHEWY BAR	Fiber One Chewy Bar	B
53710500	KELLOGG'S NUTRI-GRAIN CEREAL BAR	Kellogg's Nutri-Grain Cereal Bar	B
53710502	KELLOGG'S NUTRI-GRAIN YOGURT BAR	Kellogg's Nutri-Grain Yogurt Bar	B
53710504	KELLOGG'S NUTRI-GRAIN FRUIT AND NUT BAR	Kellogg's Nutri-Grain Fruit and Nut Bar	B
53710600	MILK 'N CEREAL BAR	Milk 'n Cereal bar	B
53710700	KELLOGG'S SPECIAL K BAR	Kellogg's Special K bar	B
53710800	KASHI GOLEAN CHEWY BARS	Kashi GOLEAN Chewy Bars	B
53710802	KASHI TLC CHEWY GRANOLA BAR	Kashi TLC Chewy Granola Bar	B
53710804	KASHI GOLEAN CRUNCHY BARS	Kashi GOLEAN Crunchy Bars	B
53710806	KASHI TLC CRUNCHY GRANOLA BAR	Kashi TLC Crunchy Granola Bar	B
53710900	NATURE VALLEY CHEWY TRAIL MIX GRANOLA BAR	Nature Valley Chewy Trail Mix Granola Bar	B
53710902	NATURE VALLEY CHEWY GRANOLA BAR WITH YOGURT COATING	Nature Valley Chewy Granola Bar with Yogurt Coating	B
53710904	NATURE VALLEY SWEET AND SALTY GRANOLA BAR	Nature Valley Sweet and Salty Granola Bar	B
53710906	NATURE VALLEY CRUNCHY GRANOLA BAR	Nature Valley Crunchy Granola Bar	B
53711000	QUAKER CHEWY GRANOLA BAR	Quaker Chewy Granola Bar	B
53711002	QUAKER CHEWY 90 CALORIE GRANOLA BAR	Quaker Chewy 90 Calorie Granola Bar	B
53711004	QUAKER CHEWY 25% LESS SUGAR GRANOLA BAR	Quaker Chewy 25% Less Sugar Granola Bar	B
53711006	QUAKER CHEWY DIPPS GRANOLA BAR	Quaker Chewy Dipps Granola Bar	B
53711100	QUAKER GRANOLA BITES	Quaker Granola Bites	B
53712000	SNACK BAR, OATMEAL	Snack bar, oatmeal	B
53712100	GRANOLA BAR, NFS	Granola bar, NFS	B
53712200	GRANOLA BAR, LOWFAT, NFS	Granola bar, lowfat, NFS	B
53712210	GRANOLA BAR, NONFAT	Granola bar, nonfat	B
53713000	GRANOLA BAR, REDUCED SUGAR, NFS	Granola bar, reduced sugar, NFS	B
53713100	GRANOLA BAR, PEANUTS , OATS, SUGAR, WHEAT GERM	Granola bar, peanuts , oats, sugar, wheat germ	B
53714200	GRANOLA BAR, CHOCOLATE-COATED, NFS	Granola bar, chocolate-coated, NFS	B
53714210	GRANOLA BAR, WITH COCONUT, CHOCOLATE-COATED	Granola bar, with coconut, chocolate-coated	B
53714220	GRANOLA BAR WITH NUTS, CHOCOLATE-COATED	Granola bar with nuts, chocolate-coated	B
53714230	GRANOLA BAR, OATS, NUTS, COATED WITH NON-CHOCOLATE COATING	Granola bar, oats, nuts, coated with non-chocolate coating	B
53714250	GRANOLA BAR, COATED WITH NON-CHOCOLATE COATING	Granola bar, coated with non-chocolate coating	B
53714300	GRANOLA BAR, HIGH FIBER, COATED W/ NON-CHOC YOGURT COATING	Granola bar, high fiber, coated with non-chocolate yogurt coating	B
53714400	GRANOLA BAR, WITH RICE CEREAL	Granola bar, with rice cereal	B
53714500	BREAKFAST BAR, NFS	Breakfast bar, NFS	B
53714510	BREAKFAST BAR, DATE, WITH YOGURT COATING	Breakfast bar, date, with yogurt coating	B
53714520	BREAKFAST BAR, CEREAL CRUST WITH FRUIT FILLING, LOWFAT	Breakfast bar, cereal crust with fruit filling, lowfat	B
53720100	BALANCE ORIGINAL BAR	Balance Original Bar	B
53720200	CLIF BAR	Clif Bar	B
53720210	CLIF KIDS ORGANIC ZBAR	Clif Kids Organic Zbar	B
53720300	POWERBAR	PowerBar	B
53720500	SNICKERS MARATHON PROTEIN BAR	Snickers Marathon Protein bar	B
53720600	SOUTH BEACH LIVING MEAL BAR	South Beach Living Meal Bar	B
53720610	SOUTH BEACH LIVING HIGH PROTEIN BAR	South Beach Living High Protein Bar	B
53720700	TIGER'S MILK BAR	Tiger's Milk bar	B
53720800	ZONE PERFECT CLASSIC CRUNCH NUTRITION BAR	Zone Perfect Classic Crunch nutrition bar	B
11541110	MILK SHAKE, HOME RECIPE, CHOCOLATE	Milk shake, home recipe, chocolate	C
11541120	MILK SHAKE, HOME RECIPE, FLAVORS OTHER THAN CHOCOLATE	Milk shake, home recipe, flavors other than chocolate	C
11541130	MILK SHAKE, HOME RECIPE, CHOCOLATE, LIGHT	Milk shake, home recipe, chocolate, light	C
11541135	MILK SHAKE, HOME RECIPE, FLAVORS OTHER THAN CHOCOLATE, LIGHT	Milk shake, home recipe, flavors other than chocolate, light	C
11541400	MILK SHAKE WITH MALT (INCL MALTED MILK W/ICE CREAM)	Milk shake with malt	C
11542100	MILK SHAKE, FAST FOOD, CHOCOLATE	Milk shake, fast food, chocolate	C
11542200	MILK SHAKE, FAST FOOD, FLAVORS OTHER THAN CHOCOLATE	Milk shake, fast food, flavors other than chocolate	C
11543000	MILK SHAKE, BOTTLED, CHOCOLATE	Milk shake, bottled, chocolate	C
11543010	MILK SHAKE, BOTTLED, FLAVORS OTHER THAN CHOCOLATE	Milk shake, bottled, flavors other than chocolate	C
95103000	ENSURE, NUTRITIONAL SHAKE, READY-TO-DRINK	Ensure, nutritional shake, ready-to-drink	C
95103010	ENSURE PLUS, NUTRITIONAL SHAKE, READY-TO-DRINK	Ensure Plus, nutritional shake, ready-to-drink	C
95104000	GLUCERNA, NUTRITIONAL SHAKE, READY-TO-DRINK	Glucerna, nutritional shake, ready-to-drink	C
95105000	KELLOGG'S SPECIAL K PROTEIN SHAKE	Kellogg's Special K Protein Shake	C
95106000	MUSCLE MILK, READY-TO-DRINK	Muscle Milk, ready-to-drink	C
95106010	MUSCLE MILK, LIGHT, READY-TO-DRINK	Muscle Milk, light, ready-to-drink	C
95201000	CARNATION INSTANT BREAKFAST, NUTRITIONAL DRINK MIX, REG,PDR	Carnation Instant Breakfast, nutritional drink mix, regular, powder	C
95201010	CARNATION INSTANT BREAKFAST, NUTR DRINK MIX, SUGAR FREE,PDR	Carnation Instant Breakfast, nutritional drink mix, sugar free, powder	C
95201200	EAS WHEY PROTEIN POWDER	EAS Whey Protein Powder	C
95201300	EAS SOY PROTEIN POWDER	EAS Soy Protein Powder	C
95201500	HERBALIFE, NUTRITIONAL SHAKE MIX, HIGH PROTEIN, POWDER	Herbalife, nutritional shake mix, high protein, powder	C
95201600	ISOPURE PROTEIN POWDER	Isopure protein powder	C
95201700	KELLOGG'S SPECIAL K20 PROTEIN WATER MIX	Kellogg's Special K20 Protein Water Mix	C
95202000	MUSCLE MILK, REGULAR, POWDER	Muscle Milk, regular, powder	C
95202010	MUSCLE MILK, LIGHT, POWDER	Muscle Milk, light, powder	C
95210000	SLIM FAST SHAKE MIX, POWDER	Slim Fast Shake Mix, powder	C
95210010	SLIM FAST SHAKE MIX, SUGAR FREE, POWDER	Slim Fast Shake Mix, sugar free, powder	C
95210020	SLIM FAST SHAKE MIX, HIGH PROTEIN, POWDER	Slim Fast Shake Mix, high protein, powder	C
95201200	EAS WHEY PROTEIN POWDER	EAS Whey Protein Powder	D
95201300	EAS SOY PROTEIN POWDER	EAS Soy Protein Powder	D
95230000	PROTEIN POWDER, WHEY BASED, NFS	Protein powder, whey based, NFS	D
95230010	PROTEIN POWDER, SOY BASED, NFS	Protein powder, soy based, NFS	D
95230020	PROTEIN POWDER, LIGHT, NFS	Protein powder, light, NFS	D
95230030	PROTEIN POWDER, NFS	Protein powder, NFS	D
53720400	SLIM FAST ORIGINAL MEAL BAR	Slim Fast Original Meal Bar	E
53720600	SOUTH BEACH LIVING MEAL BAR	South Beach Living Meal Bar	E
53729000	NUTRITION BAR OR MEAL REPLACEMENT BAR, NFS	Nutrition bar or meal replacement bar, NFS	E

Foodcode	Description	Detail	GROUP
95110000	SLIM FAST SHAKE, MEAL REPLACEMENT, REGULAR, READY-TO-DRINK	Slim Fast Shake, meal replacement, regular, ready-to-drink	E
95110010	SLIM FAST SHAKE, MEAL REPLACEMENT, SUGAR FREE, RTD	Slim Fast Shake, meal replacement, sugar free, ready-to-drink	E
95110020	SLIM FAST SHAKE, MEAL REPLACEMENT, HIGH PROTEIN, RTD	Slim Fast Shake, meal replacement, high protein, ready-to-drink	E
95120000	NUTRITIONAL DRINK OR MEAL REPLACEMENT, READY-TO-DRINK, NFS	Nutritional drink or meal replacement, ready-to-drink, NFS	E
95120010	NUTRITIONAL DRINK OR MEAL REPLACEMENT, HIGH PROTEIN, RTD	Nutritional drink or meal replacement, high protein, ready-to-drink, NFS	E
95120020	NUTRITIONAL DRINK OR MEAL REPLACEMENT, HI PROT, LIGHT, RTD	Nutritional drink or meal replacement, high protein, light, ready-to-drink, NFS	E
95120050	NUTRITIONAL DRINK OR MEAL REPLACEMENT, LIQUID, SOY-BASED	Nutritional drink or meal replacement, liquid, soy-based	E
95220000	NUTRITIONAL DRINK MIX OR MEAL REPLACEMENT, POWDER, NFS	Nutritional drink mix or meal replacement, powder, NFS	E
95220010	NUTRITIONAL DRINK MIX OR MEAL REPLACEMENT, HIGH PRO, PDR,NFS	Nutritional drink mix or meal replacement, high protein, powder, NFS	E
33001000	EGG SUB, OMELET, SCR, OR FRIED, MADE W/ MARGARINE	Egg substitute, omelet, scrambled, or fried, made with margarine	F
33001010	EGG SUB, OMELET, SCR, OR FRIED, MADE W/ OIL	Egg substitute, omelet, scrambled, or fried, made with oil	F
33001020	EGG SUB, OMELET, SCR, OR FRIED, MADE W/ BUTTER	Egg substitute, omelet, scrambled, or fried, made with butter	F
33001040	EGG SUB, OMELET, SCR, OR FRIED, MADE W/ COOKING SPRAY	Egg substitute, omelet, scrambled, or fried, made with cooking spray	F
33001050	EGG SUB, OMELET, SCR, OR FRIED, MADE WO/ FAT	Egg substitute, omelet, scrambled, or fried, made without fat	F
33001100	EGG SUBSTITUTE, CHSE FLAV,OMELET,SCRM,FRIED,FAT ADDED	Egg substitute, cheese flavored, omelet, scrambled, or fried, fat added in cooking	F
33001110	EGG SUBSTITUTE, CHSE FLAV,OMELET,SCRM,FRIED,NO FAT	Egg substitute, cheese flavored, omelet, scrambled, or fried, fat not added in cooking	F
33001120	EGG SUBSTITUTE, CHSE FLAV,OMELET,SCRM,FRIED,NS AS TO FAT	Egg substitute, cheese flavored, omelet, scrambled, or fried, NS as to fat added in cooking	F
33001200	EGG SUBSTITUTE, VEG FLAV,OMELET,SCRM,FRIED,FAT ADDED	Egg substitute, vegetable flavored, omelet, scrambled, or fried, fat added in cooking	F
33001210	EGG SUBSTITUTE, VEG FLAV,OMELET,SCRM,FRIED,NO FAT	Egg substitute, vegetable flavored, omelet, scrambled, or fried, fat not added in cooking	F
33001220	EGG SUBSTITUTE, VEG FLAV,OMELET,SCRM,FRIED,NS AS TO FAT	Egg substitute, vegetable flavored, omelet, scrambled, or fried, NS as to fat added in cooki	F
33401000	EGG SUB, OMELET, SCR, OR FRIED, W/ CHEESE, FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese, fat added in cooking	F
33401010	EGG SUB, OMELET, SCR, OR FRIED, W/ CHEESE, FAT NOT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese, fat not added in cooking	F
33401020	EGG SUB, OMELET, SCR, OR FRIED, W/ CHEESE, NS FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese, NS as to fat added in cooking	F
33401100	EGG SUB, OMELET, SCR, OR FRIED, W/ MEAT, FAT ADDED	Egg substitute, omelet, scrambled, or fried, with meat, fat added in cooking	F
33401110	EGG SUB, OMELET, SCR, OR FRIED, W/ MEAT, FAT NOT ADDED	Egg substitute, omelet, scrambled, or fried, with meat, fat not added in cooking	F
33401120	EGG SUB, OMELET, SCR, OR FRIED, W/ MEAT, NS FAT ADDED	Egg substitute, omelet, scrambled, or fried, with meat, NS as to fat added in cooking	F
33401200	EGG SUB, OMELET, SCR OR FRIED, W/VEGS, FAT ADDED IN COOKING	Egg substitute, omelet, scrambled, or fried, with vegetables, fat added in cooking	F
33401210	EGG SUB, OMELET, SCR OR FRIED, W/VEGS, FAT NOT ADDED IN COOK	Egg substitute, omelet, scrambled, or fried, with vegetables, fat not added in cooking	F
33401220	EGG SUB, OMELET, SCR OR FRIED, W/VEGS, NS FAT ADDED IN COOKI	Egg substitute, omelet, scrambled, or fried, with vegetables, NS as to fat added in cooking	F
33401300	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE&MEAT, FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese and meat, fat added in cooking	F
33401310	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE&MEAT, FAT NOT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese and meat, fat not added in cooking	F
33401320	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE&MEAT, NS FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese and meat, NS as to fat added in co	F
33401400	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE & VEG, FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese and vegetables, fat added in cooki	F
33401410	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE & VEG, FAT NOT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese and vegetables, fat not added in c	F
33401420	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE & VEG, NS FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese and vegetables, NS as to fat adde	F
33401500	EGG SUB, OMELET, SCR OR FRIED, W/ MEAT & VEG, FAT ADDED	Egg substitute, omelet, scrambled, or fried, with meat and vegetables, fat added in cooking	F
33401510	EGG SUB, OMELET, SCR OR FRIED, W/ MEAT & VEG, FAT NOT ADDED	Egg substitute, omelet, scrambled, or fried, with meat and vegetables, fat not added in coo	F
33401520	EGG SUB, OMELET, SCR OR FRIED, W/ MEAT & VEG, NS FAT ADDED	Egg substitute, omelet, scrambled, or fried, with meat and vegetables, NS as to fat added i	F
33401600	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE,MEAT&VEG,FAT ADDED	Egg substitute, omelet, scrambled, or fried, with cheese, meat, and vegetables, fat added i	F
33401610	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE,MEAT&VEG,FAT NOT ADD	Egg substitute, omelet, scrambled, or fried, with cheese, meat, and vegetables, fat not add	F
33401620	EGG SUB, OMELET, SCR OR FRIED, W/CHEESE,MEAT&VEG,NS FAT ADDE	Egg substitute, omelet, scrambled, or fried, with cheese, meat, and vegetables, NS as to fa	F
41811890	VEGETARIAN BURGER OR PATTY, MEATLESS, NO BUN	Vegetarian burger or patty, meatless, no bun	F
41812450	VEGETARIAN CHILI (MADE W/ MEAT SUBSTITUTE)	Vegetarian chili (made with meat substitute)	F
41812850	VEGETARIAN STROGANOFF (MADE W/ MEAT SUBSTITUTE)	Vegetarian stroganoff (made with meat substitute)	F
41812900	VEGETARIAN MEAT LOAF OR PATTIES	Vegetarian meat loaf or patties (meat loaf made with meat substitute)	F
59003000	MEAT SUBSTITUTE,CEREAL- & VEGETABLE PROTEIN-BASED	Meat substitute, cereal- and vegetable protein-based, fried	F
11513000	CHOCOLATE MILK, MADE FROM DRY MIX, NS AS TO TYPE OF MILK	Chocolate milk, made from dry mix, NS as to type of milk	G
11513100	CHOCOLATE MILK, MADE FROM DRY MIX WITH WHOLE MILK	Chocolate milk, made from dry mix with whole milk	G
11513150	CHOCOLATE MILK, MADE FROM DRY MIX WITH REDUCED FAT MILK (2%)	Chocolate milk, made from dry mix with reduced fat milk (2%)	G
11513200	CHOCOLATE MILK, MADE FROM DRY MIX WITH LOW FAT MILK (1%)	Chocolate milk, made from dry mix with low fat milk (1%)	G
11513300	CHOCOLATE MILK, MADE FROM DRY MIX WITH FAT FREE MILK (SKIM)	Chocolate milk, made from dry mix with fat free milk (skim)	G
11513310	CHOCOLATE MILK, MADE FROM DRY MIX WITH NON-DAIRY MILK	Chocolate milk, made from dry mix with non-dairy milk	G
11513380	NESQUIK, CHOC MILK, MADE FROM DRY MIX, NS AS TO TYPE OF MILK	Nesquik, chocolate milk, made from dry mix, NS as to type of milk	G
11513381	NESQUIK, CHOCOLATE MILK, MADE FROM DRY MIX WITH WHOLE MILK	Nesquik, chocolate milk, made from dry mix with whole milk	G
11513382	NESQUIK, CHOC MILK, MADE FROM DRY MIX WITH REDUCED FAT MILK	Nesquik, chocolate milk, made from dry mix with reduced fat milk (2%)	G
11513383	NESQUIK, CHOCOLATE MILK, MADE FROM DRY MIX WITH LOW FAT MILK	Nesquik, chocolate milk, made from dry mix with low fat milk (1%)	G
11513384	NESQUIK, CHOC MILK, MADE FROM DRY MIX WITH FAT FREE MILK	Nesquik, chocolate milk, made from dry mix with fat free milk (skim)	G
11513385	NESQUIK, CHOC MILK, MADE FROM DRY MIX WITH NON-DAIRY MILK	Nesquik, chocolate milk, made from dry mix with non-dairy milk	G
11513390	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX, NS AS TO MILK	Nesquik, chocolate milk, made from no sugar added dry mix, NS as to type of milk	G
11513391	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ WHOLE MILK	Nesquik, chocolate milk, made from no sugar added dry mix with whole milk	G
11513392	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ RED FAT MILK	Nesquik, chocolate milk, made from no sugar added dry mix with reduced fat milk (2%)	G
11513393	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ LOW FAT MILK	Nesquik, chocolate milk, made from no sugar added dry mix with low fat milk (1%)	G
11513394	NESQUIK, CHOC MILK, FROM NO SUG ADD DRY MIX W/ FAT FREE MILK	Nesquik, chocolate milk, made from no sugar added dry mix with fat free milk (skim)	G
11513395	NESQUIK, CHOC MILK, NO SUGAR ADDED DRY MIX W/ NON-DAIRY MILK	Nesquik, chocolate milk, made from no sugar added dry mix with non-dairy milk	G
11514100	HOT CHOCOLATE / COCOA, MADE WITH DRY MIX AND WATER	Hot chocolate / Cocoa, made with dry mix and water	G
11514110	HOT CHOCOLATE / COCOA, MADE WITH DRY MIX AND WHOLE MILK	Hot chocolate / Cocoa, made with dry mix and whole milk	G
11514120	HOT CHOCO, MADE WITH DRY MIX AND REDUCED FAT MILK (2%)	Hot chocolate / Cocoa, made with dry mix and reduced fat milk (2%)	G
11514130	HOT CHOC, MADE WITH DRY MIX AND LOW FAT MILK (1%)	Hot chocolate / Cocoa, made with dry mix and low fat milk (1%)	G
11514140	HOT CHOC, MADE WITH DRY MIX AND FAT FREE MILK (SKIM)	Hot chocolate / Cocoa, made with dry mix and fat free milk (skim)	G
11514150	HOT CHOCOLATE / COCOA, MADE WITH DRY MIX AND NON-DAIRY MILK	Hot chocolate / Cocoa, made with dry mix and non-dairy milk	G
11514310	HOT CHOC MADE WITH NO SUGAR ADDED DRY MIX AND WATER	Hot chocolate / Cocoa, made with no sugar added dry mix and water	G
11514320	HOT CHOC, MADE W/ NO SUGAR ADDED DRY MIX AND WHOLE MILK	Hot chocolate / Cocoa, made with no sugar added dry mix and whole milk	G
11514330	HOT CHOC, MADE W/ NO SUG ADDED DRY MIX & REDUC FAT MILK (2%)	Hot chocolate / Cocoa, made with no sugar added dry mix and reduced fat milk (2%)	G
11514340	HOT CHOC, MADE W/ NO SUGAR ADDED DRY MIX & LOW FAT MILK (%)	Hot chocolate / Cocoa, made with no sugar added dry mix and low fat milk (1%)	G
11514350	HOT CHOC, MADE W/ NO SUG ADDED DRY MIX & FAT FRE MILK (SKIM)	Hot chocolate / Cocoa, made with no sugar added dry mix and fat free milk (skim)	G
11514360	HOT CHOC, MADE W/ NO SUGAR ADDED DRY MIX AND NON-DAIRY MILK	Hot chocolate / Cocoa, made with no sugar added dry mix and non-dairy milk	G
11525000	MILK, MALTED, NATURAL FLAVOR, MADE WITH MILK	Milk, malted, natural flavor, made with milk	G
11526000	MILK, MALTED, CHOCOLATE, MADE WITH MILK	Milk, malted, chocolate, made with milk	G
11830100	HOT CHOCOLATE / COCOA, DRY MIX, NOT RECONSTITUTED	Hot chocolate / Cocoa, dry mix, not reconstituted	G
11830115	HOT CHOC, DRY MIX, NO SUGAR ADDED, NOT RECONSTITUTED	Hot chocolate / Cocoa, dry mix, no sugar added, not reconstituted	G
11830160	CHOCOLATE BEVERAGE POWDER, DRY MIX, NOT RECONSTITUTED	Chocolate beverage powder, dry mix, not reconstituted	G
11830165	CHOCOLATE BEVERAGE POWDER, REDUCED SUGAR, DRY MIX, NOT RECON	Chocolate beverage powder, reduced sugar, dry mix, not reconstituted	G
11830260	MILK, MALTED, DRY MIX, NOT RECONSTITUTED	Milk, malted, dry mix, not reconstituted	G
92305010	TEA, ICED, INSTANT, BLACK, UNSWEETENED	Tea, iced, instant, black, unsweetened	G
92305040	TEA, ICED, INSTANT, BLACK, PRE-SWEETENED WITH SUGAR	Tea, iced, instant, black, pre-sweetened with sugar	G
92305050	TEA, ICED/INSTANT/BLACK/DECAFFEINATED/PRE-SWEETENED W/SUGAR	Tea, iced, instant, black, decaffeinated, pre-sweetened with sugar	G
92305090	TEA, ICED/INSTANT/BLACK/PRE-SWEETENED W/LOW CALORIE SWEETNER	Tea, iced, instant, black, pre-sweetened with low calorie sweetner	G
92305110	TEA/ICED/INSTANT/BLK/DECAF/PRE-SWEET W/LOW CALORIE SWEETENER	Tea, iced, instant, black, decaffeinated, pre-sweetened with low calorie sweetener	G
92305180	TEA, ICED, INSTANT, BLACK, DECAFFEINATED, UNSWEETENED	Tea, iced, instant, black, decaffeinated, unsweetened	G
92305900	TEA, ICED, INSTANT, GREEN, UNSWEETENED	Tea, iced, instant, green, unsweetened	G
92305910	TEA, ICED, INSTANT, GREEN, PRE-SWEETENED WITH SUGAR	Tea, iced, instant, green, pre-sweetened with sugar	G
92305920	TEA/ICED/INSTANT/GREEN/PRE-SWEETENED W/LOW CALORIE SWEETENER	Tea, iced, instant, green, pre-sweetened with low calorie sweetener	G
92307000	TEA, ICED, INSTANT, BLACK, UNSWEETENED, DRY	Tea, iced, instant, black, unsweetened, dry	G
92307000	TEA, ICED, INSTANT, BLACK, UNSWEETENED, DRY	Tea, iced, instant, black, unsweetened, dry	G
92307400	TEA, ICED, INSTANT, BLACK, PRE-SWEETENED, DRY	Tea, iced, instant, black, pre-sweetened, dry	G
92900300	SPORTS DRINK, DRY CONCENTRATE, NOT RECONSTITUTED	Sports drink, dry concentrate, not reconstituted	G

From: Kristi Smedley
To: Harry, Molly
Cc: barbara.niess@alzchem.com; Katherine Emma Niederberger
Subject: RE: GRN 000931 - Creatine monohydrate
Date: Wednesday, August 12, 2020 10:32:03 AM
Attachments: image001.png
Supplement to GRN 000931_12.08.2020.pdf
Annex_01_CoA_creatine MH.pdf
Annex_02_CoA_creatine MH_corr.pdf

Dr. Harry:

Thank you for the opportunity to provide additional information to support GRAS Notice 931, Creatine monohydrate .

We believe that we have addressed all your questions, if for some reason we have not understood appropriately, we will gladly provide you additional information. We have attempted respond quickly, to assure that if you have additional questions, these can be addressed.

Kristi O. Smedley, Ph.D.

Center for Regulatory Services, Inc.
5200 Wolf Run Shoals Rd.
Woodbridge, VA 22192

Ph. 703-590-7337
Cell 703-786-7674
Fax 703-580-8637

From: Harry, Molly [mailto:Molly.Harry@fda.hhs.gov]
Sent: Wednesday, August 05, 2020 12:38 PM
To: Kristi Smedley
Subject: RE: GRN 000931 - Creatine monohydrate

Dear Dr. Smedley,

Our review of GRN 000931 is ongoing and the review team have the following clarifying questions related to some of the information provided in the notice that we would like you to respond to.

1. In Annex 1 of the notice (pages 75-80), you provided certificates of analyses (COAs) for three batches of creatine monohydrate (i.e., Lots 821141, 821241, and 821341). However, it is not clear to us if these results were for consecutive or non-consecutive batches of the ingredient. Please confirm if the batch analyses were for non-consecutive or consecutive batches. If the results were for consecutive batches, please provide batch analyses data for at least three non-consecutive lots of creatine

monohydrate.

2. Please identify the methods used for the analysis of each specification and indicate that all analytical methods are validated and appropriate for their purpose.

3. In Table 3 of the notice (page 8), you state that the method used to detect coliform bacteria is Ph. Eur. 2.6.13, which corresponds to Microbiological Examination of Non-Sterile Products (Test for Specified Micro-organisms). However, the COAs (Annex 1, pages 75-80) state that the method used to detect coliform bacteria is Ph. Eur. 2.6.12, which corresponds to Microbiological Examination of Non-Sterile Products (Microbial Enumeration Tests). For the administrative record, please make a statement that corrects this reference.

4. In several places of the safety narrative, your refer to "human clinical trials." Please clarify if your reference to human clinical trials and similar studies is to indicate that these studies are for drug use or you are simply referring to the human studies to support the safety of creatine monohydrate for the proposed use in GRN 931.

Please provide your response to the above questions within ten business days. If you think you will not be able to provide a complete response within the designated time frame, please contact us to discuss.

Sincerely,

Molly A. Harry
Regulatory Review Scientist

Office of Food Additive Safety, Division of Food Ingredients
Center for Food Safety and Applied Nutrition
U.S. Food and Drug Administration
Molly.Harry@fda.hhs.gov

Tel: 240-402-1075

Supplement to GRN 931

Creatine monohydrate

(Creapure®)

August 12, 2020

AlzChem Trostberg GmbH

Questions raised by CFSAN in an email dated August 05, 2020:

1. *In Annex 1 of the notice (pages 75-80), you provided certificates of analyses (COAs) for three batches of creatine monohydrate (i.e., Lots 821141, 821241, and 821341). However, it is not clear to us if these results were for consecutive or non-consecutive batches of the ingredient. Please confirm if the batch analyses were for non-consecutive or consecutive batches. If the results were for consecutive batches, please provide batch analyses data for at least three non-consecutive lots of creatine monohydrate.*

AlzChems's response:

The certificates of analysis provided for creatine monohydrate on pages 75-80 of the notice were for three consecutive batches of the ingredient. To complete the data set AlzChem provides additional certificates of analysis for three non-consecutive batches (Lots 007541, 010541 and 012442) in Annex_01_CoA_creatine MH.

2. *Please identify the methods used for the analysis of each specification and indicate that all analytical methods are validated and appropriate for their purpose.*

AlzChem's response:

The assay for creatine monohydrate and contents of creatinine, dicyandiamide and dihydrotriazine are determined by high performance liquid chromatography (HPLC) with UV detection using an in-house, validated method. The sample is dissolved in water, and creatine and the respective by-products are separated chromatographically. Calculations are performed using external standards. The method is sufficiently sensitive to detect the specified impurities with a limit of detection (LOD) of 6 mg/kg for creatinine; 4 mg/kg for dicyandiamide and 3 mg/kg for dihyrotriazine.

Residues of the heavy metals cadmium (Cd) and lead (Pb) in creatine MH are determined by inductively-coupled plasma atomic emission spectrometry (ICP-OES) using an in-house, validated method. The sample is dissolved with acid and Cd and Pb are enriched by adsorption on active carbon after complexation with pyrrolidine-1-thiocarboxylic acid ammonium salt (APDTC). After elution with nitric acid the sample is submitted to ICP-OES. The LOD is determined to 1.2 µg/kg for Cd and 14 µg/kg for Pb, respectively.
With regard to the analytical method for arsenic (As) and mercury (Hg), AlzChem detected a typographical error in Table 3 (page 8) of the notice: The method used for the analysis of As and Hg should be cited as AAS instead of ICP-OES. We apologize for this error.
The heavy metals As and Hg are determined by hydride generation atomic absorption spectrometry (AAS) using an VP-100-hydride system in an in-house, validated method. The LOD is determined to 1.7 µg/kg for As and 11 µg/kg for Hg, respectively.

Microbiology parameters are assessed using pharmacopoeial methods by a contract laboratory.

AlzChem confirms that all methods are appropriate for their use.

3. *In Table 3 of the notice (page 8), you state that the method used to detect coliform bacteria is Ph. Eur. 2.6.13, which corresponds to Microbiological Examination of Non-Sterile Products (Test for Specified Micro-organisms). However, the COAs (Annex 1, pages 75-80) state that the method used to detect coliform bacteria is Ph. Eur. 2.6.12, which corresponds to Microbiological Examination of Non-Sterile Products (Microbial Enumeration Tests). For the administrative record, please make a statement that corrects this reference.*

AlzChem's response:

The analytical method to detect coliform bacteria as given in Table 3 (page 8) is correct. Unfortunately, a typographical error occurred when issuing the certificates of analysis and has been corrected in the respective documents for lots 821141, 821241 and 821341. The corrected certificates of analysis are attached as Annex_02_CoA_creatine MH_corr.

4. *In several places of the safety narrative, your refer to "human clinical trials." Please clarify if your reference to human clinical trials and similar studies is to indicate that these studies are for drug use or you are simply referring to the human studies to support the safety of creatine monohydrate for the proposed use in GRN 931.*

AlzChem's response:

Use of the phrase "human clinical trial" did not refer to studies to support a drug use. The reference to "human clinical trials" is to indicate human studies for the dietary supplement use of creatine monohydrate that were designed to answer specific questions related to the safety and efficacy of the dietary supplement use of creatine monohydrate.

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**007541**
Production Date:	15.03.2020
Retest Date:	15.03.2023
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Typical chemical – physical properties: Fine white powder, odorless, flavorless

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	101.3
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	37
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	20
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

AlzChem Trostberg GmbH
Analytical Department

Office Germany: AlzChem Trostberg GmbH, Dr.-Albert-Frank-Straße 32, 83308 Trostberg
Phone +49 8621/86-0, Fax +49 8621/86-2911

Office USA: AlzChem LLC, 11390 Old Roswell Road, Suite 124, Alpharetta, GA 30009, USA
Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Additional information about periodic controls of Creapure®

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Salmonella sp.	§ 64 LFGB L 00.00-20	[neg/375 g]	---	neg/375 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[2] Ph. Eur. methods harmonised with USP methods, [3] Limit of Detection

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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**010541**
Production Date:	14.04.2020
Retest Date:	14.04.2023
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Typical chemical – physical properties: Fine white powder, odorless, flavorless

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	101.6
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	43
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	20
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

AlzChem Trostberg GmbH
Analytical Department

Office Germany: AlzChem Trostberg GmbH, Dr.-Albert-Frank-Straße 32, 83308 Trostberg
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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Additional information about periodic controls of Creapure®

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Salmonella sp.	§ 64 LFGB L 00.00-20	[neg/375 g]	---	neg/375 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[2] Ph. Eur. methods harmonised with USP methods, [3] Limit of Detection

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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**012442**
Production Date:	03.05.2020
Retest Date:	03.05.2023
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Typical chemical – physical properties: Fine white powder, odorless, flavorless

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	102.0
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	33
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	19
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

AlzChem Trostberg GmbH
Analytical Department

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AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Additional information about periodic controls of Creapure®

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Salmonella sp.	§ 64 LFGB L 00.00-20	[neg/375 g]	---	neg/375 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[2] Ph. Eur. methods harmonised with USP methods, [3] Limit of Detection

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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Correction

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**821141**
Production Date:	30.07.2018
Retest Date:	30.07.2021
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Typical chemical – physical properties: Fine white powder, odorless, flavorless

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	102.5
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	54
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	20
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

AlzChem Trostberg GmbH
Analytical Department,

Office Germany: AlzChem Trostberg GmbH, Dr.-Albert-Frank-Straße 32, 83308 Trostberg
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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Additional information about periodic controls of Creapure®

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Salmonella sp.	§ 64 LFGB L 00.00-20	[neg/375 g]	---	neg/375 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[2] Ph. Eur. methods harmonised with USP methods, [3] Limit of Detection

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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Correction

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**821241**
Production Date:	31.07.2018
Retest Date:	31.07.2021
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Typical chemical – physical properties: Fine white powder, odorless, flavorless

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	101.8
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	58
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	19
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

AlzChem Trostberg GmbH
Analytical Department

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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Additional information about periodic controls of Creapure®

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Salmonella sp.	§ 64 LFGB L 00.00-20	[neg/375 g]	---	neg/375 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[2] Ph. Eur. methods harmonised with USP methods, [3] Limit of Detection

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Phone 770-804-0371, Fax 770-804-0375

AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Correction

Date: 2020-08-07

Certificate of Analysis

Product:	**Creapure® (Creatine Monohydrate)**
Lot-No.	**821341**
Production Date:	01.08.2018
Retest Date:	01.08.2021
Manufacturer:	AlzChem Trostberg GmbH, Trostberg, Germany
Country of Origin:	Germany

Typical chemical – physical properties: Fine white powder, odorless, flavorless

Parameter	Method	Unit	Specification	Results
Assay[1] (HPLC)	107-138/1	[%]	≥ 99.9	102.1
Creatinine (HPLC)	107-138/1	[mg/kg]	≤ 100	40
Dicyandiamide (HPLC)	107-138/1	[mg/kg]	≤ 50	19
Dihydrotriazine (HPLC)	107-138/1	[mg/kg]	≤ 3	< 3 (=LOD)

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1 % water of crystallization.

LOD = Limit of Detection

The results based on our measures for quality assurance are in accordance with our specification.
For further questions regarding the mentioned figures please fax to +49-8621-86-2860.

AlzChem Trostberg GmbH
Analytical Department

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AlzChem Trostberg GmbH - Postfach 12 62 - 83303 Trostberg - Germany

Additional information about periodic controls of Creapure®

Microbiology

Parameter	Method [2]	Unit	Specification	Results
Moulds and yeasts	Ph.Eur. 2.6.12	[cfu/g]	≤ 50	< 10
Total aerobic plate counts	Ph.Eur. 2.6.12	[cfu/g]	≤ 1000	< 10
Coliform bacteria	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
E. coli	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g
Salmonella sp.	Ph.Eur. 2.6.13	[neg/25 g]	neg/25 g	neg/25 g
Salmonella sp.	§ 64 LFGB L 00.00-20	[neg/375 g]	---	neg/375 g
Staphylococcus aureus	Ph.Eur. 2.6.13	[neg/g]	neg/g	neg/g

Heavy Metals

Parameter	Method	Unit	Specification	Results
Mercury	107-022/1	[mg/kg]	≤ 0.10	< 0.011 [3]
Cadmium	107-022/2	[mg/kg]	≤ 0.1	< 0.001 [3]
Lead	107-022/2	[mg/kg]	≤ 0.1	< 0.014 [3]
Arsenic	107-022/1	[mg/kg]	≤ 0.1	< 0.002 [3]

[2] Ph. Eur. methods harmonised with USP methods, [3] Limit of Detection

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Office USA: AlzChem LLC, 11390 Old Roswell Road, Suite 124, Alpharetta, GA 30009, USA
Phone 770-804-0371, Fax 770-804-0375

From: Kristi Smedley
To: Harry, Molly
Cc: barbara.niess@alzchem.com
Subject: RE: GRN 000931 - Creatine monohydrate
Date: Wednesday, September 2, 2020 10:16:15 AM
Attachments: image001.png

Dr. Harry:

Although my main contact at Alzchem is not immediately available, I was able to get information from their scientific staff.

The reason for this additional parameter was a requirement from a United States customer, as such they thought it best to include this parameter was in the new CoAs.

Is this satisfactory, or would you need more details.

Kristi O. Smedley, Ph.D.

Center for Regulatory Services, Inc.
5200 Wolf Run Shoals Rd.
Woodbridge, VA 22192

Ph. 703-590-7337
Cell 703-786-7674
Fax 703-580-8637

From: Harry, Molly [mailto:Molly.Harry@fda.hhs.gov]
Sent: Wednesday, September 02, 2020 9:23 AM
To: Kristi Smedley
Subject: RE: GRN 000931 - Creatine monohydrate

Dear Dr. Smedley,

The review team has an additional clarifying question that we would like you to respond to. In the August 12, 2020 response, the notifier included two microbiological parameters for *Salmonella* sp. in the newly provided certificates of analysis (COAs) for 6 lots of the manufactured product (i.e., Annex 1 and 2, respectively). We note that the second *Salmonella* sp. parameter (negative/375 g) was not included in Table 3 of the original notice (page 8) nor in the COAs provided in the original notice (Annex 1, pages 75-80). For the administrative record, please clarify why the notifier has included an additional microbiological parameter for *Salmonella* sp. that was not included in the original notice.

Please provide your response to the above question as soon as possible.

Sincerely,

Molly A. Harry
Regulatory Review Scientist

Office of Food Additive Safety, Division of Food Ingredients
Center for Food Safety and Applied Nutrition
U.S. Food and Drug Administration
Molly.Harry@fda.hhs.gov

Tel: 240-402-1075

From:	Kristi Smedley
To:	Harry, Molly
Cc:	barbara.niess@alzchem.com
Subject:	RE: GRN 000931 - Quick Clarification Question
Date:	Wednesday, October 7, 2020 8:28:14 AM
Attachments:	image001.png 20-10-07_Supplement to GRN 000931.pdf

Ms. Harry:

Based on your email from October 6, I have attached a supplement to our filing. We apologize that the table titles were unclear. The information in Table 2 and 3 are specifications, that were separated by sampling schedule. We have revised Table 2 to be clear that all these items are a part of the specification for the notified Creatine Monohydrate.

If this is not clear, please let us know and we will immediately respond. We appreciate your diligence on this project.

Kristi O. Smedley, Ph.D.

Center for Regulatory Services, Inc.
5200 Wolf Run Shoals Rd.
Woodbridge, VA 22192

Ph. 703-590-7337
Cell 703-786-7674
Fax 703-580-8637

From: Harry, Molly [mailto:Molly.Harry@fda.hhs.gov]
Sent: Tuesday, October 06, 2020 4:44 PM
To: Kristi Smedley
Subject: GRN 000931 - Quick Clarification Question

Dear Dr. Smedley,

We need a quick clarification from you. On page 8 of the notice, Table 2 titled "Product specification of Creapure®" only lists specifications for the creatine monohydrate assay, creatine, dicyandiamide, and dihydrotriazide. However, Table 3 (p. 8-9) which lists what appears to be specifications for heavy metals and microbiology parameters is titled "Periodic controls for Creapure®." Please clarify if these are actually heavy metals and microbiology specifications for the ingredient creatine monohydrate. If they are, please provide an updated Table 3 with the appropriate title.

Thanks.

Molly A. Harry
Regulatory Review Scientist

Office of Food Additive Safety, Division of Food Ingredients
Center for Food Safety and Applied Nutrition
U.S. Food and Drug Administration
Molly.Harry@fda.hhs.gov

Tel: 240-402-1075

Supplement to GRN 931

Creatine monohydrate

(Creapure®)

October 07, 2020

AlzChem Trostberg GmbH

Product specification for Creapure® Creatine Monohydrate

Parameter	**Specification**	**Method**
Assay Creatine monohydrate[1]	≥ 99.9 %	HPLC
Creatinine	≤ 100 mg/kg	HPLC
Dicyandiamide	≤ 50 mg/kg	HPLC
Dihydrotriazine	≤ 3 mg/kg (=LOD)[2]	HPLC
Heavy metals		
Lead	≤ 0.1 mg/kg	ICP-OES
Arsenic	≤ 0.1 mg/kg	ICP-OES
Cadmium	≤ 0.1 mg/kg	ICP-OES
Mercury	≤ 0.10 mg/kg	ICP-OES
Microbiology[3]		
Molds and Yeasts	≤50 cfu/g	Ph. Eur. 2.6.12
Total aerobic plate counts	≤1000 cfu/g	Ph. Eur. 2.6.12
Coliform bacteria	neg/g	Ph. Eur. 2.6.13
E. coli	neg/g	Ph. Eur. 2.6.13
Salmonella sp.	neg/25g	Ph. Eur. 2.6.13
Staphylococcus aureus	neg/g	Ph. Eur. 2.6.13

[1] Calculated as creatine monohydrate; creatine monohydrate theoretically contains 12.1% water of crystallization; [2] LOD: Limit of detection [3] Ph. Eur. Methods are harmonized with USP methods.