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September 1992

No. 355

**ESTIMATION OF U.S. DAIRY PRODUCT
COMPONENT YIELDS**

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ESTIMATION OF U.S. DAIRY PRODUCT COMPONENT YIELDS ¹

I. Introduction.

The interregional competition model of the U.S. dairy industry computes the wholesale price of fluid and manufactured dairy products based on the implicit value of the components of all produced milk. Based on the content percentage of butterfat, protein and lactose content for each product category, the model derives the shadow price for milk components which determines the highest use value of all produced milk in dairy manufacturing. This paper will discuss the procedure which was used to estimate the percentage content of fat, protein, lactose and also solids-nonfat (SNF) for each of the nine dairy product categories studied. The "component accounting" worksheet used to compute the 1990 dairy product component yields (percentage of component per unit of commodity) is reviewed.

II. Fluid and Manufactured Dairy Products Components.

Fluid and manufactured dairy products have been grouped into nine products categories listed in Table 1.1. These include fluid, soft manufactured dairy products, frozen dairy products, American cheese, Italian cheese, all other cheese, butter, nonfat dry milk and all other manufactured dairy products. Four key milk components which comprise dairy manufacturing are analyzed: protein; carbohydrates (primarily lactose, but also including ash); milkfat solids; and, solids-not-fat (SNF). The "component accounting" worksheet designed to

¹ This research was support by the Wisconsin Milk Marketing Board research project "Interregional Competitiveness in the U.S. dairy Sector". Department of Agricultural Economics, University of Wisconsin-Madison Staff Paper No. 355, September, 1992.

estimate the percentage of these components per unit of dairy product is provided in Appendix A.

An overview of the component accounting worksheet shows how production in 1990 and published component percents for each of the nine product categories is used to estimate the weighted component percentage for each category. This is based on the share of individual products and established component yields of butterfat, protein, carbohydrate/ash, and solids-nonfat. Component percentages per product are multiplied by actual 1990 production levels to calculate the total component usage during the year. Primary data sources for component values are compiled from the Ag Handbook #8-1 (1976) and Federal Milk Order Market Statistics (1991). Manufactured dairy production in 1990 is based on published values from annual USDA/NASS and USDA/ERS reports.

Finally, the estimated totals are compared against actual milk production expressed in pounds of milk and also in pounds of total component usage for each of the four components in order to detect any residual accounting error. Since this error is small (roughly less than 6 percent across all components), all residual error is then redistributed back onto some of the product categories. The final component percentage yields are those used by the interregional model to compute the value of dairy products at the wholesale level.

Table 1: Nine Categories of Fluid and Manufactured Dairy Products in the U.S. Dairy Sector.

CONSUMER DAIRY PRODUCTS	
Fluid	Beverage fluid milk including regular and flavored milk (whole, 2%, 1%, skim) and buttermilk.
Soft Manufactured	Cream (Half and Half, heavy and light), sour cream, yogurt, eggnog, cottage cheese.
Frozen Products	Ice-cream, ice-milk, sherbet, frozen dairy mix and mellorine.
INDUSTRIAL DAIRY PRODUCTS	
Butter	Butter.
American Cheese	American, Cheddar, Colby, Monterey and processed American cheese.
Italian Cheese	Mozzarella, Provolone, Parmesan, Romano and Ricotta.
Other Cheese	Swiss, Edam, Gouda, Brick, Muenster, Gruyere, cream cheese and all other cheeses.
Nonfat Dry Milk	Nonfat dry milk.
All Other Mfg	Canned and bulk whole milk and skim milk, dry whole milk and buttermilk, and dry whey products.

III. Dairy Product Definition and Component Yields.

A discussion of the component yield determination for each dairy product category is presented below. Each product category is discussed separately since modifications and

procedures vary slightly. Refer to Appendix A which provides the component yield worksheet.

- (1) **Fluid:** For protein, carbohydrates/ash, and solids-nonfat, component values are from USDA/ARS (1976). For fluid milk, percentage values of butterfat originate from USDA/AMS (1991). The four component yields for fluid milk are based on the following categories:²
- a. **Whole:** milk, whole, 3.3% fat, fluid [USDA/ARS]; and the combined markets average percent for whole milk and flavored whole milk products [USDA/AMS].
 - b. **Lowfat (2%):** milk, lowfat 2% fat, fluid [USDA/ARS]; and the combined markets average percent for 2% plain and milk solids added [USDA/ARS].
 - c. **Lowfat (1%):** milk, lowfat 1% fat, fluid [USDA/ARS]; and the combined markets average percent for 1% plain and milk solids added [USDA/ARS].
 - d. **Skim:** milk, skim, fluid [USDA/ARS]; and the combined markets average percent for skim plain and milk solids added [USDA/ARS].
 - e. **Buttermilk:** milk, butterfat, cultured, fluid [USDA/ARS]; and the combined markets average percent for buttermilk [USDA/ARS].

² Immediately following each dairy product category is the category name as it appears in the original source material.

Weighted average component yields are based on the percent share of production between whole, lowfat, and skim milk and buttermilk [DS-431(T14)]. Production of lowfat 2% and 1% is computed from production percents in the major milk producing regions (New York and Wisconsin? USDA/??). Total component usage is computed based on 1990 production for each dairy product.

Since components of fluid milk are more or less clearly defined for fat, protein and carbohydrate content, only the residual error for SNF has been redistributed back to this category on a component share, proportional basis.

- (2) **Soft Manufactured:** For protein, carbohydrates/ash, butterfat and solids-non-fat (SNF), component values are from USDA/ARS (1976). The four component yields are based on the following published categories.
- a. **Half & Half:** cream, half and half (milk and cream, fluid).
 - b. **Heavy Cream:** cream, medium, 25 % fat, fluid.
 - c. **Light Cream:** cream, light, coffee or table, fluid.
 - d. **Sour cream:** cream, sour, cultured.
 - e. **Eggnog:** eggnog.
 - f. **Yogurt:** the average of 2 products (i) yogurt, plain, containing 8 grams of protein per 8 ounce serving, and (ii) yogurt, plain, containing 12 grams of protein per 8 ounce serving.
 - g. **Cottage Cheese:** the average of 3 products (i) cheese, cottage, creamed, (ii) cheese, cottage, lowfat 2%, and (iii) cheese, cottage, lowfat 1%.

Weighted average component yields are based on the percent share of production between all soft manufactured products [DS-431(T14)] and also cottage cheese [DS-431(T8)]. Except for the carbohydrate/ash content, the residual error for protein, butterfat and SNF has been redistributed to the this product category on a component share, proportional basis.

- (2) **Frozen:** Component values for protein, butterfat and solids-non-fat (SNF), are based on published figures from USDA/ARS (1976). Since frozen dairy products have a lot of added sugars through processing, the component yields for carbohydrate/ash are calculated based on the implicit lactose value for fluid and soft manufactured dairy products. Using the ratio of protein and carbohydrate/ash from the previous two product categories, lactose content for frozen is assessed by this imputed conversion factor. The component yields for protein, fat and SNF are based on USDA/ARS values.
- a. **Ice-Cream:** the average of 2 products (i) ice-cream, vanilla, regular (approx. 10% fat, hardened), and (ii) ice-cream, vanilla, rich (approx. 16% fat hardened).
 - b. **Sherbet:** sherbet, orange.
 - c. **Ice-Milk:** the average of 2 products (i) ice-milk, vanilla, hardened, and (ii) ice-milk, vanilla, soft serve.
 - d. **Other:** the average of 3 products (i) ice-cream, french vanilla, soft serve, (ii) shake, chocolate, thick, and (iii) shake, vanilla, thick.

- e. **Mellorine:** filled milk, containing blend of hydrogenated vegetable oils, fluid.

Weighted average component yields are based on share values according to per capita consumption of frozen dairy products in 1990 [DS-431(T11)]. Production in 1990 for frozen dairy products is the sum of products using per capita quantities adjusted by the annual U.S. population. Except for carbohydrate/ash content, the residual error for protein, butterfat and SNF has been redistributed to this product category on a component share, proportional basis.

- (4) **American Cheese:** Component values for protein, carbohydrate/ash, butterfat and solids-non-fat (SNF), are based on published figures from USDA/ARS (1976). The component yields are based on published USDA/ARS values.

- a. **Cheddar:** cheese, cheddar.
- b. **Other:** the average of 3 cheese products (i) cheese, Colby, (ii) cheese, Monterey, and (iii) cheese, American, pasteurized processed.

Weighted average component yields are based on share values according to per capita consumption in 1990 [DS-431(T11)]. Except for the carbohydrate/ash content, the residual error for protein, butterfat and SNF has been redistributed to this product category on a component share, proportional basis.

- (5) **Italian Cheese:** Component values for protein, carbohydrate/ash, butterfat and solids-nonfat, are based on published figures from USDA/ARS (1976).

- a. **Provolone:** cheese, Provolone.

- b. **Romano:** cheese, Romano.
- c. **Parmesan:** the average of 2 products (i) cheese, Parmesan, grated, and (ii) cheese, Parmesan, hard.
- d. **Mozzarella:** the average of (i) cheese, Mozzarella, (ii) cheese, Mozzarella, low moisture.
- e. **Ricotta:** cheese, Ricotta
- f. **Other:** the average of 3 cheese products (i) cheese, Ricotta (made with part skim milk), (ii) cheese, Mozzarella (low moisture, part skim), and (iii) cheese, Mozzarella (part skim).

Weighted average component yields are based on share values according to per capita consumption in 1990 [DS-431(T11)]. Except for carbohydrate/ash content, the residual error for protein, butterfat and SNF has been redistributed to this product category on a component share, proportional basis.

- (6) **All Other Cheese:** Component values for protein, carbohydrate/ash, butterfat and solids-non-fat (SNF), are based on published figures from USDA/ARS (1976).
- a. **Swiss:** cheese, Swiss.
 - b. **Muenster:** cheese, Muenster.
 - c. **Cream/Neufchatel:** the average of (i) cheese, cream and (ii) cheese, Neufchatel.
 - d. **Blue:** the average of (i) cheese, Blue, and (ii) cheese, Roquefort.
 - e. **Edam/Gouda:** the average of (i) cheese, Edam and (ii) cheese, Gouda.

- f. **Other:** the average of 6 cheese products (i) cheese, Brie, (ii) cheese, Caraway, (iii) cheese, Camembert, (iv) cheese, Cheshire, (v) cheese, Fontina, and (vi) cheese, Limburger.

Weighted average component yields are based on share values according to per capita consumption in 1990 [DS-431(T11)]. Except for carbohydrate/ash content, the residual error for protein, butterfat and SNF has been redistributed to this product category on a component share, proportional basis.

- (7) **Butter:** Component values for protein, carbohydrate/ash, butterfat and solids-non-fat (SNF), are based on published figures from USDA/ARS (1976).

- a. **Butter:** butter, regular

Since butter components are more or less straight-forward for fat, protein and carbohydrate content, only the residual error for SNF has been redistributed back to this category on a component share, proportional basis. Total component usage is based on 1990 butter production [DS-431(T8)].

- (8) **Nonfat Dry Milk:** Component values for protein, carbohydrate/ash, butterfat and solids-non-fat (SNF), are based on published figures from USDA/ARS (1976).

- a. **Dry Nonfat:** milk, dry, nonfat, regular.

Similar to fluid and butter, since the components for nonfat dry are more or less fixed, only the residual error for SNF has been redistributed back to this category on a component share, proportional basis. Total component usage is based on 1990 nonfat dry milk production [DS-431(T8)].

- (9) **All Other Dairy Manufacturing:** Component values for protein, carbohydrate/ash, butterfat and solids-nonfat, are based on published figures from USDA/ARS (1976). Similar to the frozen products category, some of the products of this category have added sugars through processing. As a result, the component yields of carbohydrate/ash are calculated based on the implicit lactose value for fluid and soft manufactured dairy products. This is done for canned and bulk whole milk and skim milk. The component yield categories are as follows.
- a. **Can-WM:** milk, evaporated, whole, canned.
 - b. **Bulk-WM:** milk, dry, whole.
 - c. **Can/Bulk Skim:** milk, evaporated, skim, canned.
 - d. **Dry-WM:** milk, dry, whole.
 - e. **Dry Buttermilk:** milk, dry, buttermilk, sweet cream.
 - f. **Dry Whey:** the average of (i) whey, acid, dry, and (ii) whey, sweet, dry.

Weighted average component yields are based on share values according to per capita consumption in 1990 [DS-431(T11)]. Since this is a residual category for all other dairy manufactured products, a weighted proportion of the residual error for carbohydrate/ash has been redistributed back to this category and the residual whey computation. In addition, the residual error for protein, butterfat and SNF has also been redistributed on a component share, proportional basis back to this product category.

IV. Total Component Usage and Accountability.

Based on the percent component yield and 1990 production for each category of fluid and manufactured dairy product, the production of protein, carbohydrate, fat and SNF in milk production is estimated for 1990. This is contrasted against actual annual values using aggregate component yields for milk. The aggregate values assume percentage yields as follows: protein (3.2%), carbohydrate/ash (4.65%), butterfat (3.67%), and solids-nonfat (8.7%). Total 1990 milk production uses 148,284 million pounds [DS-431(T2)]. After accounting for all on-farm consumption (Source:XXX) and residual whey production, the percent difference of estimated from actual can be determined.³

The percentage difference for each milk component using the procedures outlined above are protein (-0.29%), carbohydrate/ash (-5.47%), butterfat (-2.91%) and SNF (-2.96%). The residual error for protein and butterfat was redistributed back on a production proportional basis to six categories: soft manufactured, frozen dairy products, American cheese, Italian cheese, Other cheese, and all other dairy manufactured products. The residual error for solids-nonfat (SNF) was redistributed on a proportional basis back onto all the dairy product categories. The residual error for carbohydrate/ash was redistributed between residual manufactured products and also the 1990 residual whey category only.⁴

³ Residual whey computation uses total 1990 cheese production (American, Italian, and other cheese) adjusted by a series of factors and less all whey production in 1990 as follows:

$$\text{Residual Whey} = [\Sigma(Q_{AM}+Q_{IT}+Q_{OT})/10.1] * 5.6 - (Q_{WHEY}).$$

1990 cheese production in million pounds was 2891 (American), 2209 (Italian), and 961 (Other cheese); whey production was 1202 million pounds [Da2-1(91)].

⁴ Although not shown in the worksheet, this in effect increased the carbohydrate content in residual whey by 124 million pounds, up from 1596 million pounds.

The residual error for protein and butterfat was not redistributed across fluid, butter and nonfat dry milk since the component yields for these categories are more or less fixed by federal/state standards of identity. Redistribution of component "accounting" errors across the other categories was justified given the nature of the larger groupings of various dairy products and given the small percent difference between actual and estimated totals.

As can be observed in the final summary table in Appendix A, the revised component yields for the dairy product categories are not significantly altered by the procedure which redistributes the residual error among the product categories. The final component percentages are those used by the interregional model to compute the shadow price for milk components in dairy manufacturing.

V. Original Data Sources:

U.S. Department of Agriculture, ARS, Ag Handbook No. 8-1, "Composition of Dairy Products," Revised November 1976.

U.S. Department of Agriculture, Agricultural Marketing Service, "Federal Milk Order Market Statistics, 1990 Annual Summary," Table 50, SB-828, August 1991.

U.S. Department of Agriculture, Economic Research Service, "Dairy: Situation and Outlook Report, 1990 Summary," DS-431, March 1991.

U.S. Department of Agriculture, National Agricultural Statistics Service, "Dairy Products, 1990 Summary," Da 2-1, May 1991.

APPENDIX A: U.S. Fluid and Manufactured Dairy Product "Component Accounting" Worksheet, 1990.

	1990 Per Capita Sales or Production	1990 Category %Share	Component Yields				1990 Prodn/Sales (mill#)	1990 Total Component Usage			
			PROT/100g	CARB/100g	FAT/100g	SNF/100g		Protein (mill#)	Carbohyd. (mill#)	Fat (mill#)	SNF (mill#)
FLUID: wtd category average-->			3.32	4.73	2.21	8.78	54,736	1,817	2,587	1,208	4,807
share of components-->						0.47					
revised %components-->						9.11	+/- error-->	1,817	2,587	1,208	4,985
Whole		0.40	3.29	4.66	3.27	8.67	22,011	724	1,026	719	1,908
2% /1		0.40	3.33	4.80	1.98	8.87	21,754	724	1,044	431	1,930
1% /1		0.07	3.29	4.78	0.95	8.81	4,076	134	195	39	359
Skim/1		0.11	3.41	4.65	0.20	8.82	6,016	205	280	12	531
Buttermilk		0.02	3.31	4.79	0.96	8.99	879	29	42	8	79
Sum:							54,736	1,817	2,587	1,208	4,807
SOFT MFG: wt category average-->			5.56	4.65	9.20	11.03	3,760	209	175	346	415
share of components-->			0.13		0.14	0.04					
revised %components-->			5.60		9.78	11.44	+/- error-->	211	175	368	430
Half&Half		0.20	2.96	4.30	10.82	7.87	739	22	32	80	58
Heavy Cream		0.06	2.47	3.48	35.72	6.50	227	6	8	81	15
Light Cream		0.05	2.70	3.66	17.87	6.94	185	5	7	33	13
Sour Cream		0.17	3.16	4.27	16.82	8.09	626	20	27	105	51
Egg Nog		0.03	3.81	13.54	7.48	18.15	123	5	17	9	22
Yogurt		0.27	4.36	5.85	1.60	11.12	1,027	45	60	16	114
Cottage Cheese 3.40		0.22	12.87	3.01	2.49	17.04	833	107	25	21	142
Sum:							3,760	209	175	346	415
FROZEN: wtd category average-->			3.46	4.86	9.20	10.44	7,188	249	349	661	750
share of components-->			0.14	/11	0.20	0.07					
revised %components-->			3.49		9.64	10.83	+/- error-->	251	349	693	778
Ice-Cream	15.70	0.54	3.20	4.48	13.39	8.54					
Sherbet	1.20	0.04	1.12	1.57	1.98	31.95					
Ice-Milk	7.70	0.27	4.27	5.98	3.47	11.36					
Other	4.20	0.15	3.66	5.13	6.25	9.73					
Mellorine/2	0.10	0.00	3.33	4.67	3.46	8.87					

APPENDIX A: U.S. Fluid and Manufactured Dairy Product "Component Accounting" Worksheet, 1990 (continued).

	1990 Per Capita Sales or Production	1990 Category %Share	Component Yields				1990 Prodn/Sales (mill#)	1990 Total Component Usage			
			PROT/100g	CARB/100g	FAT/100g	SNF/100g		Protein (mill#)	Carbohyd. (mill#)	Fat (mill#)	SNF (mill#)
AM-CH: wtd category average-->			24.65	1.34	32.29	29.91	2,891	713	39	933	865
share of components-->			0.24		0.25	0.08					
revised %components-->			24.76		33.67	31.03	+/- error-->	716	39	973	897
Cheddar	9.15	0.82	24.90	1.28	33.14	30.11					
Other/3	1.97	0.18	23.46	1.62	28.32	29.01					
IT-CH: wtd category average-->			21.18	2.49	22.68	26.70	2,209	468	55	501	590
share of components-->			0.19		0.17	0.06					
revised %components-->			21.30		23.90	27.69	+/- error-->	471	55	528	612
Provolone	0.63	0.07	25.58	2.14	26.62	32.43					
Romano	0.21	0.02	31.80	3.63	26.94	42.15					
Parmesan	0.43	0.05	38.66	3.48	27.93	48.67					
Mozzarella	6.93	0.76	20.51	2.35	23.12	25.62					
Ricotta	0.79	0.09	11.26	3.04	12.98	15.39					
Other	0.11	0.01	21.04	3.68	13.65	27.43					
OTH-CH: wtd category average-->			19.14	2.64	28.58	24.57	961	184	25	275	236
share of components-->			0.12		0.13	0.02					
revised %components-->			19.32		30.65	25.48	+/- error-->	186	25	295	245
Swiss/Gr	1.35	0.30	28.43	3.38	27.45	35.34					
Brick	0.07	0.02	23.24	2.79	29.68	29.21					
Muenster	0.40	0.09	23.41	1.12	30.04	28.19					
Cream/Neuf.	1.72	0.39	8.76	2.80	29.15	12.87					
Blue	0.17	0.04	21.47	2.17	29.69	29.42					
Edam/Gouda	0.21	0.05	24.97	1.83	27.62	30.87					
Other	0.52	0.12	22.46	1.80	28.36	27.73					

APPENDIX A: U.S. Fluid and Manufactured Dairy Product "Component Accounting" Worksheet, 1990 (continued).

	1990 Per Capita Sales or Production	1990 Category %Share	Component Yields				1990 Prodn/Sales (mill#)	1990 Total Component Usage			
			PROT/100g	CARB/100g	FAT/100g	SNF/100g		Protein (mill#)	Carbohyd. (mill#)	Fat (mill#)	SNF (mill#)
BUTTER:	4.40	1.00	0.85	0.06	81.11	3.02	1,302	11	1	1,056	39
share of components-->						0.00					
revised %components-->						3.13 +/- error-->		11	1	1,056	41
DRY-NFAT:	2.60	1.00	36.16	51.98	0.77	96.07	877	317	456	7	843
share of components-->						0.08					
revised %components-->						99.64 +/- error-->		317	456	7	874
MFG-PR: wtd category average-->			11.67	30.98	5.40	46.87	3,652	426	1,131	197	1,712
share of components-->			0.18	0.23	0.11	0.17					
revised %components-->			11.73	37.91	5.88	48.62 +/- error-->		429	1,384	215	1,775
CAN-WM	2.10	0.18	6.81	9.54	7.56	18.40					
BULK-WM	1.00	0.09	26.32	36.89	26.71	70.82					
CB-SKIM	4.80	0.41	7.55	10.58	0.20	18.89					
DRY WM	0.60	0.05	26.32	38.42	26.71	70.82					
DRY BM	0.20	0.02	34.30	49.00	5.78	91.25					
DR-WHEY	3.00	0.26	12.33	73.96	0.81	95.85					
Total Products (mill#):						Calculated:	77,576	4,394	4,818	5,184	10,256
On-Farm Consumption:/4							2,235	72	104	82	194
Residual Whey:/5							2,159	266	1,596	17	2,069
Sum of Calculated Components (1990):								4,731	6,518	5,284	12,519
Actual Milk Production (mill#)/6:						Actual:	148,284	4,745	6,895	5,442	12,901
						Sum of Difference:/5		(14)	(377)	(158)	(381)
						Percent Difference:		-0.29%	-5.47%	-2.91%	-2.96%
						Revised Component Total:		4,745	6,895	5,442	12,901
						Sum of Difference-->		0	0	0	(0)
						Percent Difference-->		0.00%	0.00%	0.00%	-0.00%

APPENDIX A: U.S. Fluid and Manufactured Dairy Product "Component Accounting" Worksheet, 1990 (continued).

Summary Table of U.S. Dairy Products Component Yields, 1990.

	Original----->				Revised with Error----->			
	Protein	Carb	Fat	SNF	Protein	Carb	Fat	SNF
FLUID	3.32	4.73	2.21	8.78	3.32	4.73	2.21	9.11
SOFT	5.56	4.65	9.20	11.03	5.60	4.65	9.78	11.44
AM-CH	24.65	1.34	32.29	29.91	24.76	1.34	33.67	31.03
IT-CH	21.18	2.49	22.68	26.70	21.30	2.49	23.90	27.69
OTH-CH	19.14	2.64	28.58	24.57	19.32	2.64	30.65	25.48
BUTTER	0.85	0.06	81.11	3.02	0.85	0.06	81.11	3.13
FROZEN	3.46	4.86	9.20	10.44	3.49	4.86	9.64	10.83
RESIDUAL	11.67	30.98	5.40	46.87	11.73	37.91	5.88	48.62
NON-FAT	36.16	51.98	0.77	96.07	36.16	51.98	0.77	99.64

NOTES:

- /1 2% and 1% is weighted by production percents in major producing regions. Includes flavored milks.
- /2 Based on category "Filled milk" containing other oils.
- /3 Includes processed American, Colby and Monterey.
- /4 Assessed on average fat, SNF, carbohydrates & protein: 3.67%, 8.7%, 4.65% and 3.2%.
- /5 Residual Whey = $\text{Sum}(\text{Tot Ch Prod})/10.1 \times 5.6 - \text{Sum}(\text{Whey Prod})$ using 1990 whey prod't (mill#)-----> 1202
 For carboh., residual whey includes the weighted average of residual error
 of the total all other dairy manufactured goods-----> -124
- /6 Calculated error redistributed across product categories: residual error for,
 respectively, protein, carb, fat and SNF---> (14) (377) (158) (381)
 For protein and fat, share error is distributed among 6 products excluding:
 butter--> 0.00 0.00 0.20 0.00
 nonfat dry--> 0.07 0.09 0.00 0.08
 fluid--> 0.41 0.54 0.23 0.47
 Error for carbohydrate is allocated between residual manufacturing and residual whey on a weighted basis.
 Error for SNF is allocated between all product categories.
- /7 For fluid and soft (except egg nog and cottage cheese), components are computed according to the
 implicit average protein and carbohydrates--> 3.228 4.524 Factor--> 1.4015
 This implicit average is used for all frozen and can/bulk dry milk in order to account for added sugar in processing.