



The U.S. Dairy Export Council

The U.S. Dairy Export Council (USDEC) is an independent, non-profit, membership organization representing the interests of U.S. milk producers, dairy cooperatives, dairy processors, export companies and suppliers to the dairy industry. USDEC's members represent the vast majority of U.S. milk production and include companies with the widest varieties of dairy products available anywhere in the world.

This brochure is provided by USDEC to help demonstrate international food aid applications for U.S. dairy ingredients. The recipes provided in this booklet illustrate a variety of possible combinations for U.S. dairy ingredients and other U.S. commodity foods. Each application is designed to highlight the functionality, nutrition and versatility of U.S. dairy ingredients. The recipes can be tailored to individual tastes throughout the world.

The formulations presented in this publication are provided as a starting point for developmental purposes. Product developers are encouraged to modify the formulas to meet manufacturing and finished product specification needs. Check local legislation for ingredient usage, product standards and labeling.

The nutritional information provided for each formulation is for general information only and is an approximation.



Statement of Principles

USDEC supports the internationally recognized principles and protocols regarding the use of dairy ingredients in food assistance programs.

Statement on Infant Feeding, Codex Standards for Foods for Infants and Children

(Codex Alimentarius, 1989)

The value of breast milk as an ideal food for the infant during the first six months of its life cannot be too strongly stressed. However, poor health of the mother and certain social conditions can reduce lactation, separate the infant from the mother or otherwise make breastfeeding impossible. In these circumstances, it is necessary to use alternative foods such as infant formula to overcome the lack of breast milk.

Prioritization of Alternatives for Infant Feeding in Emergencies

(World Health Organization. Department of Emergency and Humanitarian Action, 2002)

Breastfeeding is the first and best feeding option for infants. No other food or liquid is required during the first six months of life—especially in emergency situations. Other, less preferable, feeding options may be appropriate in certain circumstances. These are, in decreasing order of preference—wet nursing (where HIV risk is not high*), and breast milk from a milk bank. If neither of these options is possible or acceptable, the next least dangerous option is provision of generically labeled infant formula with clear instructions on safe preparation. Should interruptions in the generic supply occur it may be necessary to buy commercially labeled formula on the local market. As a very last resort and only when it is not possible to undertake any of the above options, homemade recipes may be considered (please obtain information from the World Health Organization (WHO) or a physician). Homemade formulas lack key micro-nutrients that are necessary for adequate development and should therefore only be given for a few days until one of the other feeding options can be established.

*The practice of wet nursing may be unacceptable or inappropriate in situations of high HIV prevalence where testing, support and counseling are not available (see WHO/UNICEF/UNAIDS, 1998 for more details).

U.S. Dairy Ingredients

Nonfat dry milk (NDM) / Skim milk powder (SMP)

NDM is classified for use as an ingredient according to the heat treatment received during manufacture – which impacts the functional properties of the powder. There are three main classifications: high, medium and low heat. NDM is available in two forms: ordinary (non-instant) and agglomerated (instant). Agglomeration makes powder easier to mix in solutions, though it reduces the shelf life of the product. NDM (non-instant) has a shelf life of two years or longer in optimal storage conditions.

NDM is used in bakery, confectionery, dairy, meat products and prepared foods as:

- An economical source of nonfat dairy solids.
- A source of high heat dairy solids, important for good loaf volume in breads.
- A source of low heat dairy solids, important for optimizing sensory properties in dairy foods and beverages.
- An easily and readily transported and stored dairy ingredient.

Table 1. Recommended applications for nonfat dry milk as a function of heat treatment

Low heat	Child formula, dairy products, fluid milk fortification, cottage cheese, yogurt and cultured milk, ice cream and frozen desserts, chocolate and flavored milk beverages
Medium heat	Ice creams, confection, meat products, prepared foods and dry mixes
High heat	Baked goods, meat products, ice creams, prepared foods and dry mixes

Dry whole milk (DWM) / Whole milk powder (WMP)

DWM is used in confectionery, dairy, bakery, prepared foods and dry mixes, and some child formula or nutritional preparations. It is (1) an economical source of dairy solids, including milkfat; (2) a convenient form of nutritious milk that does not require refrigeration (while in powder form) and is easily reconstituted; and (3) an easily and readily transported and stored dairy ingredient. The shelf life of this product is limited by the presence of milkfat, which is susceptible to oxidation. For best flavor quality, DWM should be used within 6-9 months.

Whey-based products

Whey is a natural milk product. It is obtained as a co-product of cheese manufacturing. Advances in processing technologies allow manufacturers to fractionate the whey stream and offer a variety of whey-based products with modified functionalities, nutritional profiles and specific health benefits.

When processing whey, the non-protein content can be removed to concentrate the protein resulting in Whey Protein Concentrates (WPC) and Whey Protein Isolates (WPI). Other ingredients, such as lactose and dried permeate are also derived from whey. Table 2 illustrates some of the whey derived ingredients available in the U.S. Consult www.usdec.org for additional information.

Functional Properties and Applications

- Whey proteins' water-binding and gelling properties increase the viscosity of puddings, custards and yogurts; and help control separation (syneresis). In meats, seafood and baked goods they reduce cooking and baking losses, improve yields and contribute to the texture and moistness of the final product.
- Whey proteins function as well as traditional emulsifiers in mayonnaise-type dressings, sauces, cake batters, dough and ice cream.
- Whey proteins can be used to partially replace or extend eggs in bakery products due to their whipping/foaming/aeration capabilities.
- In baked goods and confectionery, whey contributes to browning during cooking.
- Whey proteins can serve to add or bring out already present flavors - whey minerals enhance meat, dairy and savory flavors.
- Whey proteins have a low viscosity and are highly soluble at temperatures below 70°C (158°F).
- In nutritional beverage applications, whey proteins can substantially increase the protein content while contributing creaminess to the beverage.

Nutritional Benefits of Dairy Ingredients

Consumption of dairy foods during childhood provides much of the energy, proteins, vitamins and minerals necessary for growth and development. During adulthood, dairy foods provide essential nutrients needed for body maintenance and protection against major chronic diseases.

Dairy ingredients are nutrient-dense and important dietary contributors of high quality proteins, calcium, phosphorus, vitamin A and several B vitamins. Milk and whey proteins contain optimal amounts of all the essential amino acids in proportions similar to human needs. According to every protein quality test, milk and whey proteins are superior to meat, beans, legumes and vegetables as a protein source.

Health Enhancing Benefits of Dairy Ingredients

Individual milk proteins have been shown to exhibit a wide range of beneficial functions including enhancing calcium absorption and immune function.

Scientific evidence continues to accumulate emphasizing that whey contains a variety of bioactive components capable of improving health and preventing diseases.

- Whey proteins are one of the very few nutritional materials shown scientifically to modulate both specific and non-specific aspects of immune function. Incorporating whey proteins into the diet may help promote strong immunity, protect the health of active people of all ages and those with compromised immune system. Due to their potential role in stimulating the immune system, whey proteins have been used successfully in the nutrition of HIV-positive patients.
- Whey proteins are highly effective at preserving / building lean muscle mass.
- Whey proteins enhance calcium absorption which helps build strong bones.

Table 2. Whey products composition and organoleptic qualities

Criteria	Units	Dry Whey (Sweet)	Whey Protein Concentrate	Whey Protein Isolate	Whey Permeate ^a	Reduced Minerals Whey ^b	Reduced Lactose Whey ^c	Dairy Minerals
Protein	%	11 - 14.5	34 - 80	90 - 92	3 - 8	11 - 15	18 - 24	1 - 8
Lactose	%	63 - 75	4 - 52	0.5 - 1	65 - 85	70 - 80	50 - 60	1 - 6
Minerals	%	8.2 - 8.8	3 - 8	2 - 3	8 - 20	1 - 7	11 - 22	76 - 77.5
Milkfat	%	1 - 1.5	3 - 9	0.5 - 1	0.2 - 1.5	0.5 - 1.8	1 - 4	n.a.
Moisture	%	3.5 - 5	3 - 5	4.5	3 - 5	3 - 4	3 - 5	4 - 7
Color	-	Off white to cream	White to light cream	Cream	Off white to cream	Cream to dark cream	Cream to dark cream	White to cream
Flavor^d	-	Whey flavor	Bland, clean	Bland, clean	Whey flavor	Whey flavor	Whey flavor	Bland, neutral

^a Also called dairy products solids, de-proteinized whey or reduced protein whey.

^b Also called demineralized whey.

^c Also called mineral concentrated whey.

^d Applies to the rehydrated form.



ICED COFFEE MILK

Ingredients	%	U.S.	Metric
Reconstituted milk	96.40	4 cups	960 ml
Instant coffee	0.40	4 tsp	7 g
Sugar	3.20	3 tsp	40 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 46, Protein 3g, Fat 0.1g, Carbohydrate 8g, Vitamin A 2IU, Thiamin 0.04mg, Riboflavin 0.2mg, Niacin 0.3mg, Vitamin B₆ 0.03mg, Vitamin B₁₂ 0.4mcg, Vitamin C 0.5mg, Calcium 110mg, Iron 0.06mg, Magnesium 13mg, Phosphorus 89mg, Potassium 176mg, Zinc 0.4mg

Procedure:

1. In a large mixing bowl (or in a blender), combine reconstituted milk, instant coffee and sugar and stir until the coffee and sugar are dissolved.
2. Chill thoroughly.

Serves 4

CHAI TEA

Ingredients	%	U.S.	Metric
Sugar	42.50	1 cup	212 g
Whole milk powder	16.35	2/3 cup	82 g
Skim milk powder	11.55	1/2 cup	58 g
Honey powder	13.55	1/3 cup	70 g
Coffee creamer	9.70	1/2 cup	50 g
Milk minerals	2.65	2 tbsp	13 g
Black tea, dry	1.90	1/4 cup	10 g
Natural flavor	1.20	1 tsp	6 g
Spice blend	0.60	1/2 tsp	3 g
TOTAL	100.00		

Recipe developed by Dairy Products Technology Center, Cal Poly State University

Nutrition Facts per 100g: *Calories 425, Protein 10g, Fat 9g, Carbohydrate 74g, Vitamin A 153IU, Thiamin 0.1mg, Riboflavin 0.5mg, Niacin 0.5mg, Vitamin B₆ 0.1mg, Vitamin B₁₂ 1mcg, Vitamin C 4mg, Calcium 960mg, Iron 0.5mg, Magnesium 77mg, Phosphorus 621mg, Potassium 578mg, Zinc 1mg*

Procedure:

- Blend sugar, honey powder, spices and black tea. Mix until well blended.
- Add dairy ingredients and mix until well dispersed.
- Add remaining ingredients. Mix well.
- Package in 31 g (3 tbsp) packets.

The chai tea mix can be stored dry for several months. The natural flavor used is cream flavor. The spices used are cardamom, clove, ginger, cinnamon and anise.

Preparation instructions:

- Mix 31 g (3 tbsp) of dry chai tea mix with 170 ml (3/4 cup) of cold water.
- Mix well.

Makes 16 packets

HIGH PROTEIN, ENRICHED BEVERAGE MIX

Ingredients	%	U.S.	Metric
Skim milk powder	23.00	2 cups	207.0 g
Whey protein concentrate, 80%	22.00	1-3/4 cups	198.0 g
Sugar	25.00	1-1/4 cup	225.0 g
Coffee creamer	12.00	1 cup	108.0 g
Vegetable oil	6.00	1/4 cup	54.0 g
Cocoa powder	3.00	1/3 cup	27.0 g
Gum blend (stabilizer)	1.50	2 tbsp	13.5 g
Natural flavor	1.40	2 tbsp	12.6 g
Instant coffee	4.00	1/2 cup	37.8 g
Milk minerals (Ca source)	1.30	2 tbsp	11.7 g
Vitamins/mineral premix	0.80	1 tbsp	7.2 g
TOTAL	100.00		

Recipe developed by Dairy Products Technology Center, Cal Poly State University

Nutrition Facts per 100g: *Calories 410, Protein 28g, Fat 13g, Carbohydrates 47g, Vitamin 3559 IU, Thiamin 0.9mg, Riboflavin 1mg, Niacin 12mg, Vitamin B₆ 1mg, Vitamin B₁₂ 4mcg, Vitamin C 45mg, Calcium 716mg, Iron 7mg, Magnesium 225mg, Phosphorus 548mg, Potassium 878mg, Zinc 9mg*

Procedure:

- Mix sugar and gum blend.
- Add coffee, mix well.
- Add the remaining ingredients, except oil, mix for 5 minutes.
- Slowly add oil, mix for additional 5 minutes.
- Package in 40 g (1/2 cup) packets.

The enriched beverage mix can be stored dry for months. This beverage is formulated 40:30:30 carbohydrates:protein:fat.

Preparation instructions:

- Mix 40 g (1/4 cup) of dry enriched beverage mix with 240 ml (1 cup) of cold water.
- Mix well.

Makes 22 packets

TROPICAL FRUIT SHAKE

Ingredients	%	U.S.	Metric
Reconstituted milk	37.10	12 cups	2.88 l
Mango juice	50.90	12 cups	2.88 l
Sugar	2.60	1 cup	200 g
Soy beverage	6.30	2 cups	480 ml
Coconut milk	3.10	1 cups	240 ml
TOTAL	100.00		

Nutrition Facts per 100g: *Calories 60, Protein 2g, Fat 0.5g, Carbohydrates 13g, Vitamin A 1985 IU, Thiamin 0.10mg, Riboflavin 0.1mg, Niacin 0.4mg, Vitamin B₆ 0.10mg, Vitamin B₁₂ 0.2mcg, Vitamin C 15mg, Calcium 60mg, Iron 0.10mg, Magnesium 13mg, Phosphorus 51mg, Potassium 163mg, Zinc 0.2mg*

Procedure:

- In a large mixing bowl (or a blender), combine reconstituted milk, mango juice (or cubed fresh mango), sugar (adjust to taste), soy beverage and coconut milk (if desired) and blend until the mixture is smooth.
- Serve ice cold.

Serves 24



WHEY PROTEIN CONCENTRATE MILK-BASED CHILD FORMULA (For industrial use only)

Ingredients	%	U.S.	Metric
Lactose	37.00	2 cups	296 g
Fat source	27.00	1 cup	216 g
Whey protein concentrate, 34%	18.50	1 1/3 cups	150 g
Skim milk powder	16.00	1 cup	128 g
Vitamins and minerals	1.00	2 tsp	8 g
Lecithin	0.50	2 tsp	12 g
Water	as needed		
TOTAL	100.00		

Recipe developed by Dairy Products Technology Center, Cal Poly State University

Nutrition Facts per 100g: Calories 520, Protein 13g, Fat 28g, Carbohydrates 55g, Vitamin A 188IU, Thiamin 0.2mg, Riboflavin 0.8mg, Niacin 1mg, Vitamin B₆ 0.2 mg, Vitamin B₁₂ 1mcg, Vitamin C 7mg, Calcium 342 mg, Iron 0.9mg, Magnesium 26mg, Phosphorus 293mg, Potassium 607mg, Zinc 0.9mg

Procedure:

1. Add whey protein concentrate, skim milk powder and lactose to water. The quantity of water should be that required to produce an easily processed, concentrated liquid.
2. Heat the solution to approximately 60°C (140°F) and mix the lecithin, fat blend, vitamins and minerals.
3. Continue heating to pasteurize.
4. Homogenize- two stage homogenization recommended with pressures of 14.1 MPa in the first stage and 3.5 MPa in the second.
5. Spray dry and agglomerate for easier reconstitution.
6. To rehydrate, blend 10% dry formula and 90% potable water by weight. Heat to pasteurize, and cool to feeding temperature.

SOY SWEET POTATO CHILD FOOD

Ingredients	%	U.S.	Metric
Cooked sweet potato	9.35	1 each	1 each
Cornmeal	4.25	1-1/2 cups	100 ml
Full fat soy flour	0.85	2 tbsp	30 ml
Water	61.55	3 cups	750 ml
Reconstituted milk	20.55	1 cup	250 ml
Sugar (optional)	3.45	1/4 cup	50 ml
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 50, Protein 2g, Fat 0.5g, Carbohydrates 11g, Vitamin A 2040IU, Thiamin 0.05mg, Riboflavin 0.1mg, Niacin 0.3mg, Vitamin B₆ 0.05 mg, Vitamin B₁₂ 0.1mcg, Vitamin C 3mg, Calcium 34mg, Iron 0.3mg, Magnesium 14mg, Phosphorus 43mg, Potassium 103mg, Zinc 0.3mg

Procedure:

1. In a medium-sized pot, mix the mashed sweet potato, the soy flour, reconstituted milk and the water until well blended.
2. Place the pot on the stove and cook until the mixture is boiling, stirring constantly. Simmer for 10 minutes.
3. If desired, add sugar and salt to taste. Add more water to adjust the consistency, if necessary.

Variation: substitute sweet potato with 1 cooked plantain.

SOY & POTATO WEANING SOUP

Ingredients	%	U.S.	Metric
Soybean oil	2.60	2 tbsp	27 g
Onion, raw	14.00	1 each	1 each
Reconstituted milk	45.50	2 cups	480 g
Baked potato	18.95	3/4 cup	200 g
Soybeans, cooked	18.95	3/4 cup	200 g
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 96, Protein 6g, Fat 4g, Carbohydrates 10g, Vitamin A 2IU, Thiamin 0.1mg, Riboflavin 0.2mg, Niacin 0.4mg, Vitamin B₆ 0.1mg, Vitamin B₁₂ 0.2mcg, Vitamin C 5mg, Calcium 90mg, Iron 1mg, Magnesium 28mg, Phosphorus 106mg, Potassium 276mg, Zinc 0.5mg

Procedure:

1. Heat oil in saucepan and sauté the onion.
2. Add the reconstituted milk, mashed potato, mashed soybeans, and a pinch of salt. Bring to simmer for 5 minutes. Add more reconstituted milk or water, if desired for a thinner soup, or let simmer a little longer until the soup thickens.
3. If desired, add other seasonings. Serve warm.





POTATO CRACKERS

Ingredients	%	U.S.	Metric
All purpose flour	36.10	2 cups	250.0 g
Potato flakes	5.20	3/4 cup	36.0 g
Sugar	7.20	1/4 cup	50.0 g
Salt	0.45	1/2 tsp	3.0 g
Baking soda	0.35	1/2 tsp	2.3 g
Soybean oil	7.85	1/4 cup	54.4 g
Reconstituted milk	26.45	3/4 cup	180.0 ml
Cream cheese	16.40	1/2 cup	113.4 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 313, Protein 6g, Fat 14g, Carbohydrates 40g, Vitamin A 234IU, Thiamin 0.1mg, Riboflavin 0.1mg, Niacin 0.8mg, Vitamin B₆ 0.07mg, Vitamin B₁₂ 0.2mcg, Vitamin C 5mg, Calcium 50mg, Iron 0.7mg, Magnesium 15mg, Phosphorus 88mg, Potassium 156mg, Zinc 0.5mg

Procedure:

1. In a large bowl, combine the flour, potato flakes, sugar, iodized salt and baking soda.
2. Stir in the oil, 1/2 cup milk and cream cheese.
3. Wrap the dough tightly in plastic wrap and refrigerate for at least 10 minutes.
4. When you are ready to make the crackers, preheat the oven to 177°C (350°F).
5. Roll out the dough on a lightly floured surface until it is paper thin and prick it several times with a fork. Brush the dough with the remaining milk and sprinkle with coarse iodized salt.
6. With a knife or pizza cutter, cut the dough into random cracker shapes.
7. Place the crackers on a cookie sheet in a single layer and bake for about 6 minutes or until golden and crisp.

Makes 48

MILKY BREAD

Ingredients	%	U.S.	Metric
Reconstituted milk	24.35	2-1/2 cups	360.0 ml
Honey	2.85	2 tbsp	42.4 g
Soybean oil	3.65	1/4 cup	54.4 g
Dry yeast	0.80	1 tbsp	12.0 g
Water	8.05	1/2 cup	120.0 ml
Soy flour	1.90	1/3 cup	28.3 g
White bread flour	16.90	2 cups	250.0 g
Whole wheat flour	40.50	5 cups	600.0 g
Salt	1.00	2-1/2 tsp	1.0 g
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 260, Protein 10g, Fat 5g, Carbohydrates 47g, Vitamin A 0IU, Thiamin 0.4mg, Riboflavin 0.3mg, Niacin 4mg, Vitamin B₆ 0.2mg, Vitamin B₁₂ 0.1 mcg, Vitamin C 0.5mg, Calcium 58mg, Iron 3mg, Magnesium 70mg, Phosphorus 210mg, Potassium 290mg, Zinc 2mg

Procedure:

1. Bring reconstituted milk and honey almost to a boil. Remove from heat, stir in oil, and let cool to lukewarm.
2. Dissolve yeast in warm water and let sit about 5 minutes, until bubbles begin to form.
3. Combine soy flour, white flour, 4 cups of the whole wheat flour and salt in a large mixing bowl.
4. Add the yeast and reconstituted milk mixtures and stir well. Add the remaining whole wheat flour as needed to make a soft dough.
5. Turn out onto a lightly floured board and knead until smooth and elastic, about 10 to 15 minutes.
6. Put dough into a lightly oiled bowl, cover and let rise until double in bulk, about 2 hours.
7. Punch down; shape into two loaves and let rise again in lightly oiled bread pans until dough reaches the top of the pan, about 45 minutes.
8. Bake for 35 to 40 minutes at 177°C (350°F), until golden and bottom sounds hollow when tapped. Remove from pans to cool.



ENRICHED THIN BREAD (Lavosh-Style)

Ingredients	%	U.S.	Metric
Flour	57.80	3-1/3 cups	419 g
Sugar	0.70	1 tbsp	5 g
Skim milk powder	3.00	1/4 cup	22 g
Salt	1.10	1/2 tsp	8 g
Water	32.90	1 cup	240 ml
Vegetable oil	4.50	2-1/2 tbsp	32 ml
TOTAL	100.00		

Nutrition Facts per 100g: *Calories 264, Protein 7g, Fat 5g, Carbohydrates 46g, Vitamin A 0IU, Thiamin 0.5mg, Riboflavin 0.4mg, Niacin 4mg, Vitamin B₆ 0.05mg, Vitamin B₁₂ 0.2 mcg, Vitamin C 0.6mg, Calcium 53mg, Iron 3mg, Magnesium 18mg, Phosphorus 96mg, Potassium 116mg, Zinc 0.5mg*

Procedure:

1. Combine flour, sugar, skim milk powder, and salt.
2. Add water and oil.
3. Mix well to make a stiff dough. Knead until dough is smooth, about 5 minutes.
4. Divide dough into 50 g balls. Roll each ball on lightly floured surface until paper thin. Place on ungreased baking sheet.
5. Bake in preheated 230°C (450 °F) oven for 10 to 12 minutes, until brown.

Makes 14

MILKY BISCUITS

Ingredients	%	U.S.	Metric
All purpose flour	26.90	1 cup	25 g
Potato flakes	10.35	1 cup	48 g
Sugar	2.70	1 tbsp	13 g
Salt, iodized	0.65	1/2 tbsp	3 g
Baking powder	2.95	1 tbsp	14 g
Vegetable shortening	22.05	1/2 cup	103 g
Reconstituted milk	34.40	2/3 cup	160 ml
TOTAL	100.00		

Nutrition Facts per 100g: Calories 355, Protein 5g, Fat 22g, Carbohydrates 34g, Vitamin A 0IU, Thiamin 0.3mg, Riboflavin 0.2mg, Niacin 2mg, Vitamin B₆ 0.1mg, Vitamin B₁₂ 0.2mcg, Vitamin C 9mg, Calcium 231mg, Iron 2mg, Magnesium 19mg, Phosphorus 148mg, Potassium 203mg, Zinc 0.4mg

Procedure:

1. Preheat the oven to 177°C (350°F).
2. In a mixing bowl, combine the flour, potato flakes, sugar, iodized salt and baking powder.
3. Make a well in the center of the dry ingredients and cut in the shortening.
4. Add the milk and stir with a wooden spoon until just combined.
5. Turn the dough out onto a lightly floured board and gently knead until the dough forms a ball. Roll the dough 1.3 cm (0.5 in) thick. Using a biscuit or cookie cutter, cut out 5 cm (2 in) rounds and place the biscuits on baking sheets. Bake for 15 minutes or until the biscuits are barely golden.

Makes 12

DIPHAPHATA

Ingredients	%	U.S.	Metric
Bread flour	63.70	7-1/4 cups	1 kg
Soy flour	1.90	1/4 cup	30 g
Sugar	2.55	1/4 cup	40 g
Salt	0.65	1-1/2 tbsp	10 g
Reconstituted milk	30.55	2 cups	480 ml
Instant yeast	0.65	1 tbsp	10 g
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 260, Protein 10g, Fat 1g, Carbohydrates 52g, Vitamin A 0IU, Thiamin 0.6mg, Riboflavin 0.5mg, Niacin 5mg, Vitamin B₆ 0.05mg, Vitamin B₁₂ 0.2mcg, Vitamin C 0.6mg, Calcium 60mg, Iron 3mg, Magnesium 27mg, Phosphorus 118mg, Potassium 180mg, Zinc 0.8mg

Procedure:

1. Mix together the flours, sugar, salt and yeast.
2. Pour the reconstituted milk into the flour and stir until the moisture is absorbed. Use a little more reconstituted milk if necessary to moisten all the flour.
3. Turn the dough onto a floured board and about 5 minutes until the mixture is smooth and not too sticky. Allow the bread to rise for 20 minutes in a warm place.
4. Divide the dough into 8 portions and form each into a round ball. Use the palms to roll each ball into a very thin circle.
5. Cook the bread on each side in a lid of the three-legged pot for 2-4 minutes on each side, until it begins to show brown spots.

UNLEAVENED BREAD

Ingredients	%	U.S.	Metric
Flour	45.40	2-2/3 cups	364 g
Skim milk powder	5.90	1/4 cup	47.2 g
Salt	0.60	1 tsp	4.8 g
Vegetable oil	3.50	2 tbsp	30 ml
Water	44.60	1-1/2 cups	360 ml
TOTAL	100.00		

Nutrition Facts per 100g: Calories 220, Protein 7g, Fat 4g, Carbohydrates 38g, Vitamin A 0IU, Thiamin 0.4mg, Riboflavin 0.4mg, Niacin 3mg, Vitamin B₆ 0.05mg, Vitamin B₁₂ 0.3mcg, Vitamin C 1mg, Calcium 93mg, Iron 2mg, Magnesium 20mg, Phosphorus 115mg, Potassium 154mg, Zinc 0.6mg

Procedure:

1. Combine flour, skim milk powder and salt.
2. Add water and oil.
3. Mix well for 2-3 minutes.
4. Pour onto greased baking sheets or pans.
5. Bake at 230°C (450°F) for 20 minutes.





MASHED POTATOES

Ingredients	%	U.S.	Metric
Reconstituted milk	61.25	1-1/3 cups	320 ml
Reconstituted milk, cold	23.35	1/2 cup	220 ml
Salt	0.55	1/2 tsp	3 g
Potato flakes	12.15	1-1/3 cups	64 g
Butter	2.70	1 tbsp	14 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 90, Fat 2g, Protein 4g, Carbohydrate 14g, Vitamin A 84IU, Thiamin 0.2mg, Riboflavin 0.2mg, Niacin 0.8mg, B6 0.1mg, B12 0.3mcg, Vitamin C 11mg, Calcium 100mg, Iron 0.2mg, Magnesium 17g, Potassium 264mg, Zinc 0.4g

Procedure:

1. In a large pot, bring the butter or oil, 1 1/3 cups of milk and 2 teaspoons of salt to a boil and remove from heat.
2. Add the 1/2 cup cold milk. Using a spoon, gradually and gently stir in the potato flakes. Do not overwork.
3. Season to taste with salt and pepper. Serve warm.

Makes 12 cups

PIROZHKI

Ingredients	%	U.S.	Metric
For filling:			
Soybean oil	1.65	2 tbsp	27.2 g
Mushroom slices	17.15	4 cups	280.0 g
Green onion, chopped	3.05	1/2 cup	50.0 g
Feta cheese	9.15	1 cup	180.0 g
Mashed potatoes w/ milk	19.30	1-1/2 cup	315.0 g
For Pirozhki:			
Reconstituted milk	9.10	10 tbsp	150 g
Dry yeast	0.75	1 tbsp	20 g
Sugar	1.55	2 tbsp	25 g
All purpose flour	15.30	2 cups	280 g
Eggs	9.15	3 each	150 g
Butter	7.65	9 tbsp	125 g
Potato flakes	5.85	2 cups	96 g
Salt	0.35	1 tsp	6 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 215, Protein 6g, Fat 11g, Carbohydrates 24g, Vitamin A 333IU, Thiamin 0.2mg, Riboflavin 0.3mg, Niacin 2mg, Vitamin B₆ 0.2mg, Vitamin B₁₂ 0.3mcg, Vitamin C 7mg, Calcium 73mg, Iron 0.8mg, Magnesium, 17mg, Phosphorus 120mg, Potassium 257mg, Zinc 0.8mg

Procedure:

1. In a large bowl, stir the milk, yeast, sugar and 1/2 cup of the flour together. Cover and rest at room temperature for 30 minutes.
2. In a separate small bowl, lightly beat the eggs and butter or oil.
3. Stir the egg mixture, the remaining flour, potato flakes and salt into the yeast mixture. (The dough will not be completely combined at this stage.)
4. Dust your hands with flour, turn the dough out onto a lightly floured surface and knead for several minutes until the dough is smooth and elastic. (The dough will appear lumpy because of the potato flakes.)

5. Place the dough in an oiled bowl and turn it so that the top is coated with oil. Cover and let rise at room temperature until doubled in volume, about 2 hours.
6. Shape the dough into a long cylinder and cut it into slices, cover and rest for 10 minutes. Roll each slice into a circle and place a teaspoon of filling in the center. Fold the dough over the filling and seal the edges. Alternatively, divide the dough in half. Roll each half out into a 12-inch circle and place half of the filling in the center dough circle. Fold the dough over the filling and seal the edges.
7. Place the Pirozhki on a baking tray, brush with egg and sprinkle with poppy seeds, if desired.
8. Bake in a hot oven, 245°C (475°F) until golden, about 15 minutes for individual Pirozhki and 20 to 25 minutes for larger Pirozhki.

Serves 20



WHITE MAIZE MEAL PORRIDGE

Ingredients	%	U.S.	Metric
Maize meal	4.90	2/3 cup	81.25 g
Soy flour	0.30	1 tbsp	5.00 g
Reconstituted milk	90.80	6-1/4 cups	1.50 l
Sugar	4.00	1/3 cups	66.00 g
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 70, Protein 4g, Fat 0g, Carbohydrates 13g, Vitamin A 231U, Thiamin 0.05mg, Riboflavin 0.2mg, Niacin 0.3 mg, Vitamin B₆ 0.05mg, Vitamin B₁₂ 0.40mcg, Vitamin C 2mg, Calcium 133mg, Iron 0.3mg, Magnesium 22mg, Phosphorus 115mg, Potassium 185mg, Zinc 0.5mg

Procedure:

1. Mix maize meal and soy flour in a pot.
2. Stir in reconstituted milk and bring the mixture to a boil. Reduce heat and simmer, stirring occasionally, for 10 minutes.
3. Stir in the sugar and salt. Serve warm.

Makes 7 cups



Main Dishes



POTATO & SPINACH CASSEROLE

Ingredients	%	U.S.	Metric
Potato, cut in quarters	20.95	2 cups	300 g
Spinach, chopped	14.00	7 cups	200 g
Cheddar cheese, grated	7.00	1 cup	100 g
Reconstituted milk	16.95	1 cup	240 ml
Soy beverage	16.90	1 cup	240 ml
Onion, chopped	20.70	2 each	2 each
Vegetable oil	2.90	3 tbsp	45 ml
Turmeric	0.15	1 tsp	5 ml
Pepper, black	0.15	1 tsp	5 ml
Curry powder	0.15	1 tsp	5 ml
Salt	0.15	1 tsp	5 ml
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 95, Protein 4g, Fat 6g, Carbohydrates 8g, Vitamin A 1019IU, Thiamin 0.07mg, Riboflavin 0.1mg, Niacin 0.5mg, Vitamin B₆ 0.1mg, Vitamin B₁₂ 0.1mcg, Vitamin C 10mg, Calcium 98mg, Iron 0.9mg, Magnesium, 24mg, Phosphorus 80mg, Potassium 295mg, Zinc 0.5mg

Procedure:

1. Boil potatoes in salted water until tender.
2. Sauté onions in cooking oil; add turmeric, curry powder, pepper and salt to taste.
3. Add reconstituted milk and allow simmering for about 10 minutes.
4. Add spinach and allow cooking for a minute.
5. Put the whole mixture into the ovenproof dish and cover with cheddar cheese and allow to brown under a hot grill for 3-5 minutes.



MASHED SOYBEAN & CABBAGE SOUP

Ingredients	%	U.S.	Metric
Vegetable oil	2.20	2 tbsp	27.0 g
Garlic, clove crushed	0.25	1 each	1 each
Onion, chopped	12.00	1 each	1 each
Reconstituted milk	19.50	1 cup	240.0 ml
Soybeans, cooked, mashed	14.50	1 cup	180.0 g
Carrot, medium chopped	5.85	1 each	1 each
Spice (mixed herbs)	0.15	1 tsp	1.5 g
Salt	0.50	1 tsp	6.0 g
Pepper, black	0.05	1/2 tsp	2.0 g
Cabbage, small pieces	16.20	3 cups	200.0 g
Water	28.80	1-1/2 cups	360.0 ml
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: Calories 60, Protein 3g, Fat 3g, Carbohydrates 5g, Vitamin A 1167IU, Thiamin 0.06mg, Riboflavin 0.08mg, Niacin 0.3 mg, Vitamin B₆ 0.04mg, Vitamin B₁₂ 0.09mcg, Vitamin C 10mg, Calcium 63mg, Iron 0.6mg, Magnesium 15mg, Phosphorus 51mg, Potassium 197mg, Zinc 0.3mg

Procedure:

1. Heat oil in a pot and sauté the chopped onion and minced garlic until the onion softens.
2. Add the reconstituted milk, the mashed soybeans, the carrot, mixed herb spice, salt and pepper. Heat to a simmer and cook for 5 minutes.
3. Add the cabbage pieces and simmer until the cabbage softens. Add more reconstituted milk, if desired, and adjust the seasonings to taste. Serve hot.

BEIGNETS

Ingredients	%	U.S.	Metric
All purpose flour	31.30	2 cups	250 g
Reconstituted milk	45.15	1-1/2 cup	48 g
Dry yeast	1.00	2 tsp	8 g
Egg, large	6.25	1 each	1 each
Butter	3.55	2 tbsp	28 g
Potato flakes	12.00	2 cups	96 g
Salt, iodized	0.75	1 tsp	6 g
Oil for frying			
TOTAL	100.00		

Nutrition Facts per 100g: Calories 210, Protein 7g, Fat 4g, Carbohydrate 37g, Vitamin A 149IU, Thiamin 0.2mg, Riboflavin 0.2mg, Niacin 2mg, Vitamin B₆ 0.2mg, Vitamin B₁₂ 0.3mcg, Vitamin C 11mg, Calcium 78mg, Iron 0.8mg, Magnesium 24mg, Phosphorus 127mg, Potassium 273mg, Zinc 0.6mg

Procedure:

- In a large bowl, whisk or stir the milk, yeast and 1 cup of the flour together. Cover and rest at room temperature (21°C/ 70°F) for 30 minutes.
- In a separate small bowl, lightly beat the egg and butter.
- Stir the egg mixture, the remaining flour and salt into the yeast mixture. (The dough will not be completely combined at this stage.)
- Dust your hands with flour, turn the dough out onto a lightly floured surface and knead for several minutes until the dough is smooth and elastic. (The dough will appear lumpy because of the potato flakes.)
- Place the dough in an oiled bowl and turn the dough so that the top is coated with oil. Cover and let rise at room temperature until doubled in volume, about 2 hours.
- Turn the dough out onto a lightly floured surface.
 - No filling:* Roll the dough out to a thickness of 0.5 cm (1/4 in). Cut the dough into 5 cm (2 in) squares, cover and let rest for 10 minutes.
 - With filling:* Roll the dough out to a thickness of

0.3 cm (1/8 in). Cut the dough into 5 cm x 10 cm (2 in x 4 in) pieces, cover and let rest for 10 minutes. Add filling of your choice. Dip your finger in water and dampen the edges of the dough. Fold the dough over the filling and seal the edges.

- Meanwhile, heat the oil in a wide, heavy saucepan or deep fryer to 180°C (350°F). Carefully add a few beignets to the oil. Fry for 1 minute, then flip and fry for 1 to 2 minutes more. Remove the beignets and drain. Repeat with the remaining beignets and serve immediately.

Makes 24

BEIGNETS – SAVORY FILLING

Ingredients	%	U.S.	Metric
Mashed potatoes	45.10	1/2 cup	105 g
Cream cheese	49.80	1/2 cup	116 g
Chives, chopped	5.10	1/4 cup	12 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 210, Protein 5g, Fat 18g, Carbohydrate 9g, Vitamin A 943IU, Thiamin 0.05mg, Riboflavin 0.1mg, Niacin 0.6mg, Vitamin B₆ 0.1mg, Vitamin B₁₂ 0.2mcg, Vitamin C 6mg, Calcium 56mg, Iron 0.8mg, Magnesium 13mg, Phosphorus 77mg, Potassium 209mg, Zinc 0.4mg

Procedure:

- To make the filling, place the mashed potatoes in a large mixing bowl and fold in the cream cheese and chives.
- Place 1 tsp of filling in the center of each piece of dough.

Makes 24

BEIGNETS – SWEET FILLING

Ingredients	%	U.S.	Metric
Jam	44.45	1/4 cup	80 g
Sugar (optional)	55.55	1/2 cup	100 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 330, Protein 0g, Fat 0g, Carbohydrate 84g, Vitamin A 0IU, Thiamin 0mg, Riboflavin 0mg, Niacin 0mg, Vitamin B₆ 0mg, Vitamin B₁₂ 0mcg, Vitamin C 5mg, Calcium 1mg, Iron 0mg, Magnesium 0mg, Phosphorus 1mg, Potassium 34mg, Zinc 0mg

Procedure:

- Place 1/2 tsp jam or 1 tsp cooked fruit in the center of each piece of dough.

Variation: substitute jam with cooked fruit.

Makes 24





RICE PUDDING

Ingredients	%	U.S.	Metric
Reconstituted milk	81.70	4 cups	960.0 ml
Rice	3.90	1/4 cup	46.0 g
Sugar	2.15	2 tbsp	25.0 g
Salt, iodized	0.15	1/4 tsp	1.5 g
Dried fruit	6.80	1/2 cup	80.0 g
Nuts, chopped	5.30	1/2 cup	62.0 g
TOTAL	100.00		

Nutrition Facts per 100g: Calories 110, Protein 5g, Fat 3g, Carbohydrate 16g, Vitamin A 16IU, Thiamin 0.06mg, Riboflavin 0.2g, Niacin 0.2mg, Vitamin B₆ 0.08mg, Vitamin B₁₂ 0.4mcg, Vitamin C 2mg, Calcium 125mg, Iron 0.5mg, Magnesium 25mg, Phosphorus 120mg, Potassium 231, Zinc 0.6mg

Procedure:

1. In a large heavy-bottomed saucepan, combine the milk, rice, sugar and iodized salt. Bring to a simmer and cook, stirring frequently, over medium heat until the rice is very tender, about 45 minutes.
2. Stir in the orange zest, dried fruit and nuts and simmer for 5 minutes more. If desired, add more sugar to taste.
3. Serve hot or chilled with the additional 1 cup of milk drizzled over the top.

COCOA SOY PUDDING

Ingredients	%	U.S.	Metric
Reconstituted milk	64.80	1 cup	240 ml
Soybeans, roasted	8.10	3 tbsp	30 g
Cocoa	14.80	2/3 cup	55 g
Egg yolk	8.95	2 each	2 each
Sugar	3.35	1 tbsp	12 g
TOTAL	100.00		

Recipe developed by World Initiative for Soy in Human Health (WISHH)

Nutrition Facts per 100g: *Calories 150, Protein 10g, Fat 6g, Carbohydrate 18g, Vitamin A 176IU, Thiamin 0.1mg, Riboflavin 0.3g, Niacin 0.5mg, Vitamin B₆ 0.1mg, Vitamin B₁₂ 0.6mcg, Vitamin C 2mg, Calcium 117mg, Iron 2mg, Magnesium 30mg, Phosphorus 170mg, Potassium 492, Zinc 0.9mg*

Procedure:

1. Put the reconstituted milk into a small saucepan with the roasted soybeans. Place over a low heat and bring to a boil. Turn off the heat and leave to infuse for 10 minutes.
2. Dissolve cocoa into a thin smooth consistency.
3. Whisk the egg yolks with the sugar until pale and creamy.
4. Strain the milk into the cocoa and add the egg yolk mixture.
5. Pour this mixture into a rinsed out saucepan and place over a low heat, stirring until the mixture thickens to that it will coat the back of the spoon (3-4 minutes), but do not boil. Strain into a bowl.

HIGH PROTEIN COOKIES

Ingredients	%	U.S.	Metric
Pastry flour	18.30	1-3/4 cup	155 g
Whey protein concentrate 80%	18.30	1-1/3 cup	155 g
Brown sugar	21.30	1 cup	180 g
Salt, iodized	0.25	1/2 tsp	2 g
Baking soda	0.25	1/2 tsp	2 g
Butter	13.35	1/2 cup	112 g
Skim milk powder	1.25	2 tbsp	11 g
Eggs	2.55	1 each	1 each
Chocolate chips	17.35	1 cup	150 g
Vanilla extract	0.30	1 tsp	3 g
Water	6.80	1/4 cup	60 ml
TOTAL	100.00		

Recipe developed by Dairy Products Technology Center, Cal Poly State University

Nutrition Facts per 100g: *Calories 400, Protein 19g, Fat 17g, Carbohydrate 48g, Vitamin A 425IU, Thiamin 0.08mg, Riboflavin 0.2mg, Niacin 0.8mg, Vitamin B₆ 0.01mg, Vitamin B₁₂ 0.06mcg, Vitamin C 0.2mg, Calcium 116mg, Iron 2mg, Magnesium 13mg, Phosphorus 93mg, Potassium 247mg, Zinc 0.06mg*

Procedure:

1. Cream butter with sugar.
2. Add vanilla and eggs.
3. Add dry ingredients, mix until blended.
4. Add chocolate chips.
5. Bake at 190°C (375°F) for 8 to 10 minutes.

Makes 2-1/2 dozen



U.S. Dairy Ingredients in Food Assistance Programs

Recipes & Applications

Instructions to Reconstitute Milk Powder into Liquid Milk

Stir 100 g of milk powder in 1 liter of cool water or, to make a smaller amount, 10 g of milk powder in 100 ml of water. Hint: Reconstitution may be easier if the powder is progressively added to the water while stirring. The milk can be consumed immediately or used in recipes. To avoid spoilage, any liquid milk leftover should be covered, refrigerated and used within a few days.

One glass of nonfat milk (250 ml) will provide 90 calories with 9 g of protein, 12 g of carbohydrate and 2 g of milk minerals of which 316 mg of calcium and 255 mg of phosphorus.

As with many dry ingredients, it is critical that only clean water and other ingredients with the appropriate microbiological, sensory and functional attributes be utilized in recombined and reconstituted milk products. It is also essential that manufacturing conditions be established and controlled to insure the safety of the finished product, up to the time of consumption.



Glossary of Terms

Whereas the terms nonfat dry milk & skimmed (skim) milk powder and dry whole milk & whole milk powder are, respectively, used interchangeably in this brochure and oftentimes by the trade, the terms are actually defined by two different sets of regulations and authorities (FDA and CAC). In addition, regulations of individual governments may differ.

CAC: Codex Alimentarius Commission

DWM: Dry Whole Milk; defined by FDA

FDA: United States Food and Drug Administration

NDM: Nonfat Dry Milk; defined by FDA

SMP: Skimmed (Skim) Milk Powder; defined by CAC

USAID: United States Agency for International Development

USDA: United States Department of Agriculture

WMP: Whole Milk Powder; defined by the CAC

WPC: Whey Protein Concentrate

WPI: Whey Protein Isolate

References

For additional information on U.S. dairy ingredients and how they can work in food assistance programs, consult the following USDEC publications at www.usdec.org:

- U.S. Dairy Ingredients in Food Assistance Programs – Nutritional, Functional Benefits and Major Applications.
- Reference Manual for U.S. Milk Powders. 2005 Revised Edition.
- Reference Manual for U.S. Whey and Lactose Products. 2003.
- Application Monograph Series (several titles available).

Acknowledgements

The U.S. Dairy Export Council would like to extend its appreciation to all who contributed to the development of this brochure, and would like to recognize the contribution of the staff at the Dairy Products Technology Center, California Polytechnic State University, San Luis Obispo, CA, USA and Dairy Management Inc.

Resources

The U.S. Dairy Export Council (www.usdec.org) provides in-depth information on U.S. dairy ingredients, formulations and specifications. Moreover, a search engine is provided to find U.S. dairy ingredients suppliers.

Dairy Management Inc. (www.dairyinfo.com) provides direct links to:

www.innovatewithdairy.com: specifications for, and formulations using milk powder and whey ingredients. Information for food processors and technologists.

www.nationaldairycouncil.org: a resource for current scientific research that supports the health benefits of dairy foods, or to locate basic dairy nutrition facts. Information for health professionals and consumers.

www.nutritionexplorations.org: nutrition information for educators and parents.

The food composition database of the USDA provides detailed nutritional information on all dairy products (www.nutritionexplorations.org).

For information on specific food aid programs administered by USDA or USAID, and specifications for dairy ingredients under these programs, please consult, respectively, www.fas.usda.gov and www.usaid.gov.

For more information on infant feeding policies please refer to the International Code of Marketing of Breast-Milk Substitutes published by the World Health Organization, available at www.who.org. Also refer to the following documents published by USAID and available at: www.usaid.gov.

- Policy on the Use of Nonfat Dry Milk for Supplementary Feeding.
- Policy on the Use of Nonfat Dry Milk for Therapeutic Feeding.
- Policy on the Use of Nonfat Dry Milk for Title II Monetization.