

Commodity Information Sheets

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AVAILABLE COMMODITY INFORMATION SHEETS

The Commodity Information Sheets provide basic information on some of the commodities that the Foodgrains Bank provides. Each sheet gives a basic description of the commodity, its uses, limitations, nutritional value, cost, shelf life, and possible substitutes. Below is a list of currently available information sheets:

Title
<u>Wheat</u>
<u>Lentils</u>
<u>Beans</u>
<u>Canola Oil</u>
<u>Potato Granules</u>
<u>Milk Powder</u>

description

The wheat varieties most commonly shipped by the Canadian Foodgrains Bank include Canadian Red Western Spring, Canadian Prairie Spring (both hard red spring wheats), Amber Durum, and Ontario Eastern (a soft winter wheat). Various grades are available. Often a Number 3 wheat is the grade of choice, given the expense and questionable value of higher grades in food aid situations. Wheat is shipped bulk or in 50kg bags.

The Foodgrains Bank also ships enriched white flour, which is produced from the starchy endosperm of the wheat kernel. Since it lacks the nutrient-rich germ and bran, white flour is required by Canadian law to be enriched with B-vitamins, iron, magnesium and calcium. Wheat flour is available in 25kg or 50kg bags.

uses

Wheat is a versatile commodity that is prepared in a wide variety of ways, depending on the local context. In Ethiopia or Eritrea, it may be used to make a spongy flat bread called *injera*; in India or Bangladesh, denser flat breads known as *chapati*, *roti* or *naan*; in West Africa wheat may be cracked and boiled as a porridge; in Latin America, wheat flour may be used in tortillas; in many areas, leavened bread is also commonly consumed.

limitations

Possible limitations to the use of wheat in a food aid project include:

- **acceptability:** Wheat has been widely used in food aid programs, but at times the choice has been based more on the availability of wheat on domestic markets in donor countries than on the acceptability of wheat to the beneficiaries. The possible effects of wheat distribution on local tastes and markets should be carefully considered in areas that do not traditionally consume wheat as a staple.
- **processing and preparation:** As with most dry grains, wheat must be processed and prepared before it is suitable for consumption. It is important to assess whether local milling facilities are accessible if required.

nutritional information

Wheat is higher in protein, and comparable in energy to corn and rice.

Nutritional content per 100g

source: USDA

variety	energy (kcal)	protein (g)	fat (g)	density (MT/container)	energy per \$ (kcal, approx)
Wheat – Red Spring	329	13	2	18-22	11,750
Wheat – Amber Durum	339	13	2.5	18-22	16,500
Wheat Flour – Enriched	364	10	1	15-19	10,300

cost

Grain prices vary, but wheat generally represents a fairly low cost source of energy. Spring 1999 prices for cleaned and bagged wheat were around CDN\$280/MT. Flour is more expensive (roughly 1¼ times the price of whole grain) due to the processing costs.

storage

Under ideal conditions (off the floor, away from excess heat, moisture and insects), wheat grain is very stable and may last indefinitely. Wheat should be tested for hot spots and spoilage regularly – especially in the less-than-ideal conditions common in food aid.

The preferred storage for wheat flour is at temperatures less than 20°C and less than 70% humidity. Flour may also absorb strong odours to which it is exposed. Under ideal conditions, the nutritional quality of wheat flour should last at least six months.

substitutes

Corn (maize) and rice are both nutritionally comparable to wheat. Commodity selection should consider cost, local tastes and ability to process and prepare the food. Where rice is a more appropriate commodity, a swap or local purchase may be necessary.

description

Lentils are flat, round, lens-shaped members of the dry legume family. The seeds are commonly classified by size and colour. Small lentils (less than 40mg/seed) are commonly called 'Persian' types, while large lentils (more than 50mg/seed) are known as 'Chilean' varieties. The seed may have green, yellow, or red cotyledons with a dark brown, green, or transparent seed coat. Canada is the world's largest exporter of green lentils. The two most common Canadian varieties are Laird, a large lentil (seed diameter of 6mm), which is the industry standard, and Eston, a small lentil (4-4.5mm diameter), which has the benefit of retaining its shape when cooked. The Foodgrains Bank has also shipped French Green (Dark Speckled) and red varieties. The following table classifies Canadian lentil varieties by colour and size.

Size	Green	Red
Small	Eston French Green (Dark Speckled) Matador Milestone Royale	Crimson Redwing
Medium	Richlea Gold Vantage	Red Chief
Large	Laird Glamis	

uses

Lentils provide protein and energy, as well as B-vitamins and minerals. Unlike most dry pulses, they do not require pre-soaking and cook relatively quickly. Asia is the area of highest lentil production and consumption. Curried *dhal*, as it is known, is a common meal throughout countries such as India and Bangladesh. The lentils are often mixed with fish or other vegetables, satisfying local tastes and providing more complete protein. Variety preferences may be based on factors such as taste, appearance or cooking time.

limitations

While lentils are a good source of protein, they do not provide *complete* protein. Like any vegetable protein source, they are deficient in certain essential amino acids – the building blocks of protein needed to maintain body tissues and functions. Lentils are low in the amino acids methionine and cysteine. However, when lentils are consumed with grains such as wheat and rice, which have a higher proportion of methionine and cysteine, this deficiency is reduced.

nutritional information

Nutritional content per 100g

Source: USDA

variety	energy (kcal)	protein (g)	fat (g)	protein quality*
Red Lentils	346	25	2	62%
Green Lentils	338	28	1	62%

*Limiting amino acid (met + cys) as % of total protein compared with recommended % based on egg protein

cost

Pulse prices tend to fluctuate significantly. However, lentils are relatively inexpensive on the Canadian market.

storage

Green seed coats will discolour with age. Aging may also increase cooking time as the seeds become desiccated. Lentils should be stored in dry conditions, out of direct light.

substitutes

Most other pulses are acceptable nutritional substitutes, depending on local tastes.

description

Beans are pulses – members of the family *Leguminosae* (the legumes), characterized by seeds that generally appear clustered within in pods. Canada is the world's fifth-largest exporter of dried beans. The Foodgrains Bank ships a variety of dried beans, including kidney beans, navy beans, faba beans, black, red, brown, pink, pinto, and cranberry beans. Beans are rated for quality based on their size, colour and shape. The commodity is generally shipped in 50 kg bags.

uses

Cultures throughout the world have developed recipes that use beans in soups, sauces, curries, side dishes and even drinks. As local preferences for taste, size and colour vary widely, it is important to be certain of the variety being requested, and any acceptable substitutes. Beans are a good source of protein, complex carbohydrate (starch), fibre, b-vitamins, and potassium. They are also high in iron and folic acid – two micronutrients that can counter anemia.

limitations

While beans are a good source of protein, they do not provide *complete* protein. Like any vegetable protein source, they are deficient in certain essential amino acids – the building blocks of protein needed to maintain body tissues and functions. Beans are generally low in the amino acids methionine and cysteine. However, when beans are consumed with grains such as wheat and rice, which have a higher proportion of methionine and cysteine, this deficiency is reduced.

The relatively long cooking time can be reduced by pre-soaking the beans, but will still be an important consideration – especially in situations where cooking fuel is limited, or where fuel shortage is leading to deforestation or other environmental damage.

nutritional information

Nutritional content per 100g

Source: USDA

variety	energy (kcal)	protein (g)	fat (g)	protein quality*
Black Beans	340	22	1	75%
Faba Beans	340	26	2	60%
Great Northern	340	22	1	75%
Kidney Beans	335	24	1	75%
Navy Beans	335	22	1	75%
Pink Beans	340	21	1	75%
Pinto Beans	340	21	1	75%
Small Red Beans	350	22	1	75%
Soybeans	415	36	20	85%

*Limiting amino acid (met + cys) as % of total protein compared with recommended % based on egg protein

cost

Bean prices fluctuate widely according to season, quality, variety and other market factors. Prices may vary from \$300 to \$900 per metric tonne.

shelf life

Stored dry, beans should keep indefinitely. However, after one year, beans may begin to toughen and discolour somewhat. Older beans take longer to cook.

substitutes

Other bean varieties or other pulses such as lentils or peas may be appropriate nutritional substitutes for a given bean variety, depending on local preferences.

description

Canola oil is a light, clear edible oil made by pressing the seeds of the canola plant. Canola has been selectively bred from rapeseed – a plant that produces a heavier oil used as a machine lubricant. Canola oil is a good stable cooking oil that is high in the essential fatty acids linoleic and alpha-linoleic acid. In addition, the Canadian International Development Agency (CIDA) requires that canola oil shipped as food aid be fortified with vitamin A (a fat soluble vitamin).

The Foodgrains Bank provides canola oil in 200 litre (190kg) barrels or cases of four 5-litre jugs.

uses

Canola oil can be used in a variety of ways, from dressings to deep-frying. Its high smoking temperature makes it a good cooking oil, and it does not have a distinctive flavour of its own, making it acceptable in a range of recipes.

In general, oil is a source of essential fatty acids required for the healthy functioning of organs such as the brain, eyes and skin. It also increases the palatability of dry foods.

The World Health Organization's recommended full daily ration includes 50g of oil. In general, the oil-to-cereal (wheat, corn, rice etc.) ratio is approximately 1:8.

limitations

In general, cooking oil does not encounter the problems of local acceptability common with other staple commodities. Possible limitations of the product include:

- **storage:** As described below, edible oil will go rancid if stored for many months in less than ideal conditions. Oil may spoil if the project encounters delays during which the oil is exposed to heat and/or light.
- **dietary fat intake limits:** Nutritionists recommend that no more than 30% of dietary energy come from fat. This may be a useful statistic to bear in mind for centralized feeding programs such as hospital or school feeding. Most people are used to cooking with oil, and will use appropriate amounts.
- **vitamin A loss:** Although the oil is fortified with vitamin A, this nutrient will be lost if the oil is cooked. Since most of the oil shipped is used as cooking oil, there is generally little or no benefit from the fortification.

nutritional information

Nutritional content per 100g

Source: USDA

commodity	energy (kcal)	protein (g)	fat (g)	vitamin A (IU)
Canola oil (fortified)	884	0	100	3300

cost

Spring 1999 prices for canola oil are approximately US\$800 / CDN\$1200 per metric tonne for oil packed in cases. At this price, canola oil yields 7370 kcal of energy per Canadian dollar. Oil packaged in barrels is priced at a discount to oil packaged in cases.

shelf life

Canola oil may last for a year if kept cool and dark. Exposure to light and heat will speed the oxidation process, turning the oil rancid.

substitutes

Canola oil is the primary edible oil shipped by the Foodgrains Bank. Canola is healthier than many other oils, due to its low saturated fat content. However, locally produced oils may be preferred, if available, as they are a sustainable choice in the long term.

description

Potato granules come as a fine powder that is mixed with boiling water to yield a food similar in texture and taste to mashed potatoes. The production process involves peeling, cooking and drying potatoes, which are then reduced to granules of one or a few cells each. Some chemical additives are used to prolong shelf life.

uses

Potato granules are intended as a potato substitute. Fresh potatoes are too perishable for use in food aid situations. Given the ease of preparation and minimal energy inputs, potato granules may be preferable to wheat or rice as a source of carbohydrates (energy) in situations such as refugee camps where access to cooking facilities is limited. In areas where food is being prepared centrally, potato granules may be mixed with milk powder to provide additional protein and micronutrients, and to increase palatability.

limitations

Possible limitations of the product include:

- **cost:** As detailed in the section on cost, below, potato granules are significantly more expensive than other sources of carbohydrate.
- **acceptability:** As with any food selection, local tastes should be understood and respected as much as possible.
- **water-borne disease:** As with milk powder, reconstitution with contaminated, inadequately treated water increases the risk of water-borne disease (diarrhea etc).

nutritional information

Nutritional content per 100g

Source: USDA

commodity	energy (kcal)	protein (g)	fat (g)	density (MT/container)	energy per \$ (kcal, approx)
Potato Granules	372	8	0.5	20-25	3540
Potato Flakes	354	8	0.4	5-6	3930
Wheat	330	12	1.5	18-22	11,750
Wheat Flour	350	11	1.5	15-19	10,280

cost

Cost is one of the biggest drawbacks to the use of potato granules in food aid projects. April, 1999 prices for a metric tonne of granules range between \$1050 and \$1300, as compared with \$280 and \$354 for wheat grain and wheat flour respectively. As an energy transfer, wheat is over three times as efficient per dollar versus potato granules. Wheat also contains 5.6 times the protein per dollar value. Wheat flour is more expensive, due to the processing cost, but is still significantly more efficient than potato granules.

However these numbers are somewhat misleading as the wheat and wheat flour values represent pre- or mid-processing figures, whereas the potato granules are a processed, ready-to-eat product. The amount of nutrient lost in processing will vary depending on the method of processing and preparation. Extra energy costs borne by the recipients should be taken into account, especially in refugee situations where recipients may lack the facilities (mills, cooking pots, stoves etc.) to process and prepare the food.

An additional benefit of potato granules is their high density (see table above). Packing more commodity into each container means lower shipping costs.

shelf life

Potato granules are packed in poly-lined sacks. In appropriate conditions (cool and dry), the product will last for up to one year.

substitutes

Other sources of carbohydrate such as wheat, corn or rice (locally purchased) are roughly nutritionally equivalent. Commodity selection should consider cost, local tastes and ability to process and prepare the food.

commodity information sheet

MILK POWDER

description

Milk powder is made by drying fluid milk. The powder can be easily transported and stored, and then reconstituted by adding water. The most common varieties of powdered milk are dried whole milk, dried skim milk (DSM), and fortified dried skim milk.

uses

The UNHCR, UNICEF, WFP, WHO and CIDA all have policies governing the use of milk powder in food aid programs to prevent its misuse in child feeding. Due to the limitations listed below, most organizations recommend that milk powder be used only in well-supervised therapeutic feeding programs, *not* for take-home distribution. Depending on specific reconstitution ratios, one kilogram of milk powder will make around 2.5 l of milk.

limitations

Milk powder has a number of limitations and should be used with extreme caution in food assistance programs. Some of the main concerns are listed below:

- **infant malnutrition:** The misuse of powdered milk and formulas as a breast milk substitute has been a major problem in child malnutrition. Young infants fed on powdered milk fill their bellies but do not receive sufficient nutrition or protection from disease. Incorrect dilutions of milk powder in water can result in toxic effects or undernutrition. *Clearly communicate the dangers of feeding milk powder to infants.*
- **diarrhea:** Milk powder may cause or worsen diarrhea. The fat content of whole milk powder may cause diarrhea in famine situations. Using any milk powder in areas where there is unclean water increases the risk of diarrhea and other water-borne illnesses, especially among young children. In many parts of the world, people cannot digest the lactose sugar found in milk. This can cause diarrhea in older children and adults. *Only use milk powder in areas where cow's milk is traditionally consumed.*
- **vitamin deficiency:** Vitamin A is found in the fat of whole milk. Regular skim milk powder contains little vitamin A. *To counter vitamin-A deficiency blindness, use only vitamin A fortified milk powder.*
- **cost:** As detailed below, milk powder is fairly costly, especially when compared with possible substitutes such as a corn-soy blend.

nutritional information

Nutritional content per 100g

Source: USDA

variety	energy (kcal)	protein (g)	fat (g)	vitamin A (IU)
Dried Whole Milk	500	26	27	920
Dried Skim Milk	360	35	1	36
Fortified Dried Skim Milk*	360	35	1	2370

* Fortified dried skim milk generally contains enhanced vitamin A and D content.

cost

Depending on price fluctuations, for an equivalent amount of protein, milk powder may be two to seven times the cost of beans, five times the cost of lentils, and eight times the cost of peas. Milk powder may be up to seven times the cost of an acceptable therapeutic feeding substitute such as corn-soy blend.

shelf life

After eight months, fortified skim milk powder may have lost its vitamin A content and should be treated as unfortified dried skim milk. After two years of storage, skim milk powder should be inspected to determine fitness for human consumption.

substitutes

Corn-soy blend (CSB) may be an acceptable substitute for milk powder in therapeutic feeding formulas.

The best nutrition an infant can receive is exclusive breastfeeding for the first six months and continued breastfeeding up to at least two years of age, coupled with safe, nutritious, locally available foods.