

Storing Dried Milk



Non-fat dried milk (NFDM) is suitable for short and long term emergency food storage. It is made from non-fat, grade A, milk that has been dried by spraying into hot air or heated on a drum. The process removes nearly all of the water prohibiting the growth of microorganisms. Dried whole milk and dried buttermilk have milk fat and are not suitable for long term storage. Start with top quality product. Some NFDM is "instantized", a process that makes it easier to reconstitute. "Extra-grade" is higher quality and some manufacturers supplement dried milk with vitamins A and D. A product meeting all three of these options would be the best for storage. Evaluate several brands of dried milk before purchasing any large quantity for emergency storage. A 3BYU study in 2002 concluded there is wide variation in the quality of dried milk products available for long-term storage.

Packaging

Dried milk must be stored free of moisture and oxygen. Mylar-type bags and #10 cans make good containers for large quantities. Canning jars are suitable for smaller quantities provided light is prevented from reaching the dried milk. Other plastic containers are less suitable, e.g. food-grade buckets. Oxygen absorbers should be used to remove oxygen from containers to extend shelf life and minimize off-flavors. A 2USU study concluded that after 4-year NFDM samples stored in plastic bags (not Mylar-type) were statistically less acceptable than samples stored in cans. The form of milk (instant or regular) did not affect the length of time NFDM could be stored. Unacceptability of samples in the study was due to an oxidized/stale flavor.

Storage Conditions

The shelf life of packaged, NFDM ranges from 3 months to 3-5 years. The main factor is storage temperature. At cool to cold temperatures the shelf life is 3-5 years. At hot temperatures the shelf life can be as little as 3 months. A

2USU research study demonstrated NFDM held at 32°C (90°F) for 6 mo began to develop off-flavors and by 24 mo was considered unacceptable by a trained sensory panel. After 4-yr storage, NFDM samples stored at 21°C (70°F) were rated unacceptable by the panelists. Storage at 10°C (50°F) resulted in minimal flavor changes in 52 month.

Nutrition

NFDM is an excellent source of protein, calcium and nutrition, providing 80 calories per serving. Most vitamins in dried milks are present in comparable levels to those of whole milk. Vitamins A and D are not present in non-fat milk and must be supplemented.

Nutrition Degradation During Storage

Vitamin levels are stable for 6 month and only minimally decline after 18 months. Data is not available for longer term storage effects on vitamins. Storage of these products for periods longer than several years will result in vitamin and flavor degradation. Most other nutrients (calories, carbohydrates, proteins, and minerals will remain unchanged.

Use of NFDM from Storage

Typically 1/3 cup dry powder is mixed with one cup water to make one serving. The instantized type of NFDM will dissolve in water more readily. Non-instantized versions may need blending or can be held overnight in the refrigerator after reconstituting to increase solubility. Reconstituted NFDM will not taste any better than fresh non-fat milk. If the absence of milk fat is objectionable, mix reconstituted NFDM into whole fresh milk. Once opened, NFDM will have a 3 month shelf life. Keep opened containers away from light, moisture and warmer temperatures.

References

- U.S. Dairy Export Council 2001
- Driscoll, Brennand, and Hendricks. 1985. Sensory Quality of Nonfat Dry Milk After Long-Term Storage J. Dairy Sci. Vol. 68, No. 8
- Lloyd and Pike. 2002. Quality attributes of dried milk products packaged for long term storage. IFT Annual Meeting Abstract
- Lloyd, Ogden, and Pike. 2003. Quality of hermetically packaged nonfat dry milk in long-term storage. IFT Annual Meeting Abstract

- USU Publications - Storage of Dried Milk

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