

Energy Concentrates (Grains and By-Product Feeds)

The main nutrient contribution of grains and by-product feeds is energy. Oats and barley are moderately high in CP. Processing grain (rolling, crimping, cracking, or grinding) increases its digestibility when fed to cows. As much as 30 percent of the whole grain will pass through cows intact if the grain is not processed before feeding. Breaking the seed coat increases digestion. Coarse-textured, processed grain enhances palatability and intake. Fine grinding of grain can increase digestibility, but can also lower milk fat percent and cause rumen acidosis. Pelleted grain is not dusty, and may increase palatability and intake, but has the same disadvantages as finely ground grain on rumen fermentation. Because young animals chew their feed more thoroughly than adults, whole grains can be fed up to 12 months of age.

Barley is a good source of energy and protein. If barley is used in large amounts in dairy cattle rations, cattle should be adjusted gradually. Rolling is superior to fine grinding for palatability. If barley is finely ground, it shouldn't make up more than 50 percent of the grain ration.

Beet pulp can be obtained either in plain form or as molasses beet pulp. It is relatively high in energy, adds highly digestible fiber and bulk to diets, and enhances palatability. Maximum feeding rate is 30 percent of the ration DM.

Corn, shelled is the most common grain fed to dairy animals. It is one of the highest energy feeds available for use in dairy rations. Where corn can be grown successfully, it is generally an economical source of energy. Because of its high caloric density, good management (determining the amount to feed, frequency of feeding, mixing with other feeds, etc.) is needed to obtain maximum consumption without causing digestive disturbances.

Molasses (cane and beet) supplies energy and is used primarily to enhance the acceptability of the ration. The amount used should be limited to 5 to 7 percent of the grain mix (10% in pelleted feeds) to maintain flow characteristics in automatic feeding equipment and to avoid undesirable rumen effects.

Oats contain 15 percent less energy but 20 to 30 percent more protein than shelled corn. The advantage of adding oats to dairy rations is that it adds fiber and bulk, and may help maintain rumen function.

Wheat is not used often because price is usually too high. It is acceptable in dairy cattle rations in reasonable amounts (less than 50 percent of the grain ration). It is high in energy and relatively high in protein. Cattle should be adjusted slowly to rations containing wheat.

Wheat bran is included to add bulk and fiber to the diet. It is relatively high in protein and phosphorus, improves ration palatability, and functions as a laxative.

Soybean meal is the most common and usually the most economical vegetable protein supplement. The most common soybean meal contains 44 percent CP as fed. Two other sources of soybean meal are: dehulled soybean meal (48 percent CP), and expeller or old processed soybean meal (42 percent CP and 5 percent fat). Many commercial supplements contain substantial amounts of soybean meal.

The other half of the diet is called the concentrate. The concentrate is comprised of carbohydrates, proteins, fats, and minerals and vitamins.

Carbohydrates

Primary sources: barley, corn, oats, wheat, molasses, beet pulp, and soyhulls. Most dairy farmers grow their own barley, corn, oats, and wheat and will often process these grains to be fed to the cows. Molasses, beet pulp and soyhulls are purchased from a feed mill. Not all of these carbohydrate sources are used as other sources are needed to complement the forage to meet the nutritional requirements of the cows.

Protein

Primary sources: canola meal, distillers grains, soybean meal, and corn gluten meal. The protein, fat, minerals, vitamins and feed additives are mixed together at a feed mill and brought to the dairy farm to be fed to the dairy cows.

Fat

Primary sources: vegetable oil, tallow, and protected fatty acids.

Minerals and Vitamins

Primary sources: Calcium, Phosphorus, Magnesium, Sodium, Chloride, Potassium, Sulfur, Iron, Zinc, Manganese, Copper, Cobalt, Iodine, Selenium, Vitamin A, D, E and some B-vitamins too. They are essential for the health and productivity of the cows and farmers and nutritionists will make sure all of these nutrients are balanced. Prebiotics and probiotics are also often used to help with digestion and as another way to ensure cows are healthy.

Although many of the concentrate ingredients listed are fairly standard, but some dairy farmers that are closer to large city centers can also take advantage of by-products from commercial food processors, such as potato waste, fruit and vegetable waste, etc. What processors call waste is actually a by-product for the dairy feed industry. Dairy cows are excellent recyclers and can take these unwanted by-products that have great nutritional value and use them in their diets while reducing the amount of grain cows eat. Great care taken on selecting ingredients that are healthy for dairy cows to remain productive and sustainable.

A rule of thumb for feeding grain is feeding 1 pound of grain for every 3 pounds of milk produced. Dairy grain usually contains 16 to 20 percent protein. If good quality hay is fed, then 16% is adequate. If hay is poor, then consider feeding 20% protein along with 5 or 6 pounds of beet pulp per day. Below is a guideline for feeding grain: