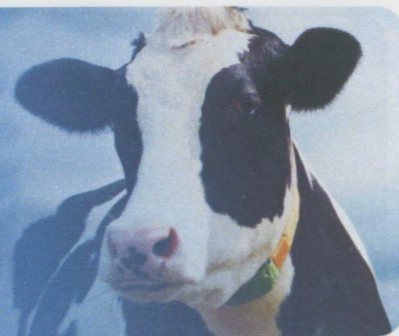




Dairy Briefs

The Latest Information
on Dairy Cattle Nutrition



High Forage Dairy Diets: Yes or No?

By Pedro Nogueira

When balancing diets for dairy cows one of the main considerations, is that cows are ruminants. They have the incredible ability to convert forages (fibre) into useful food products. Forages are generally the cheapest feeds on the farm. Therefore we should try to maximize forage inclusion and usage in dairy diets to reduce the amount of grain. The problem arises when this approach is thought as a kind of a philosophy or dogma and cows must be fed high forage diets independent of forage quality and other issues that we will discuss later.

Grains have always been widely used in dairy rations. In fact, as Dr. Normand St-Pierre from Ohio University puts it, at some point we started to think that dairy cows have a requirement for corn. This is not correct, both nutritionally and economically. The fact is that, historically, low corn prices coupled with its wide availability have led to heavy corn utilization as the main source of energy. Grains are an excellent source of starch which is highly fermentable by ruminal micro-organisms. The fatty acids produced in the rumen as a result of this fermentation are a very important source of energy to the cow, and the

ruminal bacteria produced through that fermentation provide about 50 to 60 % of the protein needs of the cow as they are washed out of the rumen and digested in the abomasum and small intestine. At the same time many nutritional rules of thumb, especially developed in the United States, were derived during times when corn was a very inexpensive feed ingredient and not surprisingly some of those rules tend to push for a lot of grain into the diets to meet some constraints, for example having 25 to 30% starch in the total diet. Diets in the United States tend to benefit milk production and are not particularly concerned with milk composition, namely milk fat percentage as is the case in Canada and other countries. Some of those rules of thumb are now not only difficult to apply with the present high grain costs, but also are sometimes detrimental to milk butterfat percentages. In fact, in some situations when we have high starch diets, cows may experience acidosis and one of the consequences may be low butterfat test.

Rumen microbes do not have a requirement for starch per se, their energy requirement can be satisfied

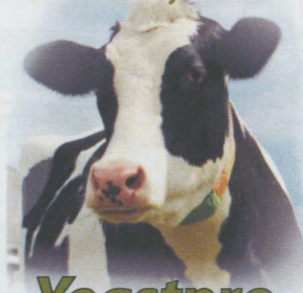
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Inside this Issue...

HIGH FORAGE DIETS: YES or NO?

By: Pedro Nogueira

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by fermentable carbohydrate derived either from other NFC (Non Fibre Carbohydrates, like sugars, organic acids, glucans and pectins) or from NDF (Neutral Detergent Fibre). This means that we can increase the use of forage and/or by-products in dairy diets. The key is to optimize rumen function by maintaining adequate levels of forage NDF and providing readily fermentable carbohydrate in the form of NDF and NFC.

To decrease the amount of grain in the diets three strategies can be used: 1) increasing forage inclusion, 2) increasing forage quality and 3) more extensive use of by-product feeds. These 3 approaches may be best used in combination. One alternative to feeding corn grain is to feed more corn silage and fewer legumes. Corn silage provides fermentable starch, energy and relative amounts of effective fibre. Dr. Robinson, from University of Davis documented this increase in corn silage feeding in California dairies, as shown in the following figures.

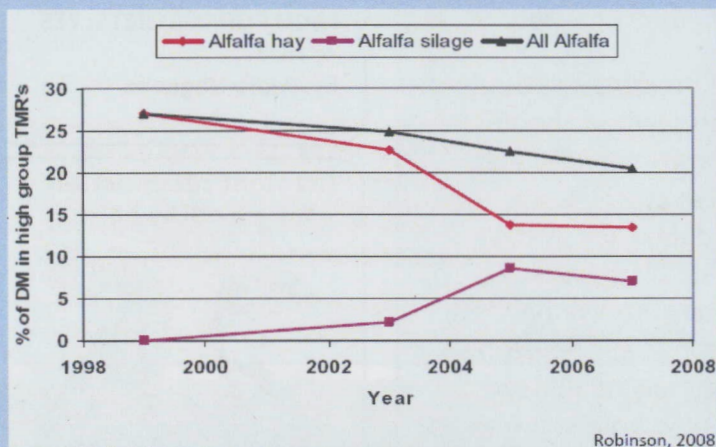


Fig 1. – Use of Alfalfa Hay and Silage

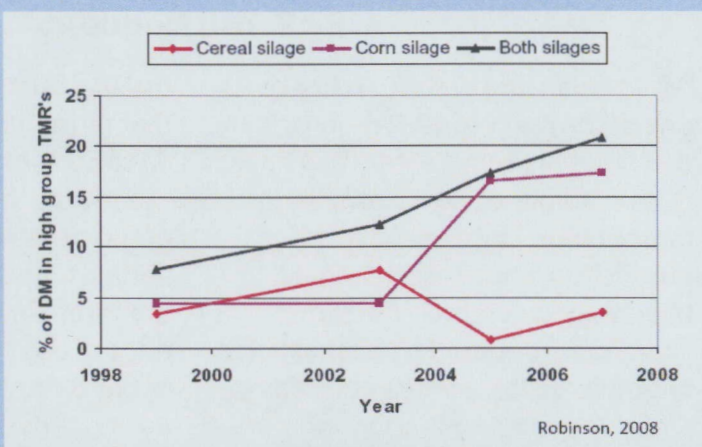


Fig. 2 – Use of Corn and Cereal Silages

So, does this mean that we can just increase the amount of forage, mainly corn silage, in the diets of dairy cows, and expect always the same results as with higher grain diets? As always, it depends on several aspects. According to Cornell Univ. Professor Larry Chase, as with any management practice, there are always some considerations that need to be evaluated. Some of the most common ones for herds desiring to feed higher forage rations include:





- * A large supply of consistent quality forage is required. As higher forage rations are fed, less energy and protein is provided from the grain mix. Thus, variations in forage quality may be more evident since there is ability to adjust for forage quality variations via the grain mix.
- * Feeding and feed bunk management must be excellent to assure that fresh, high quality forages are always available. This also includes enough feed bunk space, no overcrowding, good comfortable beds (the higher the forage in the diet the longer the cow needs to rest to ruminate, so the longer she will have to lie down). Higher forage diets require more time to eat. This in turn puts more pressure on the feet, so good comfort is a must.
- * More forage inventory and storage capacity is needed for the same number of cows. Total yearly forage needs can increase by 15-30% when higher levels of forage are fed.
- * Routine forage inventory or forage use evaluations need to be made. This will prevent running out of forage early before the next forage harvest season.
- * More attention to forage storage and allocation may be needed. Very few herds have only "high quality" forages available. Planning may be required to store forages by quality at harvest. Allocating specific forages or silos to specific animal groups during feedout may also be required to obtain the best response from these higher quality forages. The ability to store and feed forages by quality is a problem in some herds.

**ARE YOU FEELING
THE HEAT OF
DEALING WITH
HOT SILAGE
OR POOR
QUALITY
HAY?**

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- * The quality of the forage, especially its energy value and digestibility must be high. Dairy cows can only eat so much forage before they are physically limited by the size of their rumen. If the cows have the genetics for high production, these cows may experience a more pronounced negative energy balance (especially fresh cows), may lose body condition faster and, as a consequence, have reproductive problems and/or some metabolic diseases.
- * During summer stress cows eat less dry matter. This is accentuated with high forage diets because higher levels of fibre increase the internal production of heat.
- * Crop rotation is one of the very important agronomic tools that a crop producer has to employ. Alfalfa and corn complement each other in several unique ways and shifting forage production toward more corn silage at the expense of alfalfa often results in fewer situations where corn follows alfalfa and more corn after corn acres. Where corn does follow alfalfa, research has demonstrated a 10 to 15% yield increase compared to corn after corn.

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