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Managing the dairy business in the next decade

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Four conferences were presented at the last American Dairy Science Association meeting in Minneapolis (July 2006) to discuss the dairy business in the near future: labor management, feeding dairy cows, reproduction and dairy facilities.

The labor management works point out that the first step in developing a labor management strategy in the future is envisioning who the labor force will be. Agriculture will increasingly depending on foreign labor (mainly Hispanics) for the next decade to fill a wide array of positions. The main questions to discuss are: What type of positions will the business need as it grows? Will technology be adopted as a tradeoff against labor? What are the opportunities and implications for attracting or developing a workforce? The final step in a labor management strategy is the selection and implementation of organizational and human resources management practices, such a standard operating procedures, an employee handbook, job descriptions, performance feedback systems, and training and developing of the talent resource within the business.

Some of the discussed challenges for feeding high producing dairy cows in the next decade are: Feed efficiency, not only to improve the conversion of feeds to animal products, also, to decrease nutrients excretions and odor emissions. Nutrient sources that may have multiple impacts, like some essential fatty acids, which may enhance rumen fermentation, increased nutrient absorption, improve animal fertility and milk quality for human health. Others factors mentioned were: use of computer models to achieved desired milk yield and components, improved forage quality and yield to produce optimum nutrient yield, responses evaluation of new feed additives, economical benchmarks according to the production system, etc. The concern on limiting resources to conducting basic and applied nutrition research, and the mayor role of the feed industry on these aspects was also considered.

Reproduction efficiency in dairy cows currently is suboptimal due to four factors: 1. poor detection and expression of estrus, 2. high incidence of anovular cows, 3. poor conception rates, and 4. a high incidence of pregnancy loss. Over the past decade, hormonal protocols to synchronize and resynchronize cows has helped to overcome factor 1 and to some extent factor 2. Regarding factor 3, clearly fertility has decrease over the past 50 years. Factor 3 and factor 4 are closely related, fertility is a function of both conception rates and pregnancy loss. For that reason, one challenge is to develop strategies that reduce embryonic loss. Other factor is to mitigate the negative effects of twining in dairy herds, especially if twining rates continue to increase.

Respect to facilities, and due to the trends to decrease the number of dairies with a greater number of animals, the emphasis has been placed on cow comfort and its impact on milk production, reproduction and animal health. Some of the major factors that need to be considered concerning cow comfort are: feedline space, access to water, grouping strategies, group size, time spend milking, travel distances to the parlor, cow handling system, ability to manage heat stress, and housing design. Local climate, biosecurity concerns and food safety, and the environmental regulations will have a major impact on the future dairy buildings.

Milk Fat Depression in Dairy Cows

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Milk Fat Depression (**MFD**) syndrome is a dietary prevalent problem in many dairy herds that are feeding high yielding dairy cows. A significant understanding on MFD syndrome occurred in the last years and clearly different factors may be acting individually or together to determine a lower milk fat content. This article is focused on some of the possible dietary factors involved to MFD.

One of the first steps that nutritionists evaluate when they face a MFD problem is the dietary effective Neutral Detergent Fiber (efNDF). The Penn State University developed a method to evaluate the dietary efNDF, which is based on the particle size of the forages or the total mixed ration. A minimum dietary efNDF guideline of 22% is required to provide a healthy rumen environment, maximizing cow's intake, milk yield and composition. Some times in a herd with high prevalence of lame cows and MFD, the solution may be just adjusting the efNDF of the diet, but this solution is not always so simple.

Recent articles indicate that some minerals in the diet can be associated to variations in milk fat. Studies from Ohio State University shown the increased concentration of sulfur (over animal requirement) in the diet may affect dry matter intake, milk yield and milk composition including fat and protein content. These effects were greater when increased concentrations of selenium were fed, indicating a negative interaction between these two minerals. More recently, other researchers supplied different sources of trace minerals (zinc, copper, manganese and cobalt) to dairy cows, e.g. inorganic forms and complex trace minerals; and they found effects on lactation performance variables (reproduction and health parameters), including milk yield and fat contents.

Probably one of the most recent discoveries related to MFD is the Biohydrogenation Theory, which according to the authors, accommodate limitations of the *trans* Fatty Acids Theory. Researchers from Cornell University suggested the name of biohydrogenation theory based on the concept that under certain dietary conditions the pathways of rumen biohydrogenation are altered to produce unique fatty acids intermediates, which some of them are potent inhibitors of milk fat synthesis. Small amounts of the fatty acid named *trans*-10 *cis*-12 CLA are considered one of the main inhibitors of milk fat synthesis in the mammary gland.

Ruminal dilution rates might also be related to MFD. Shortage of water, particularly in hot summers, may affect the dilution rate in the rumen while decreasing fiber fermentation and chemical precursors for milk fat synthesis. Probably some factors that need to be re-evaluated during heat stress situations for high yielding animals are feedline space and access to water.

Summarizing, MFD can be related to dietary fiber, intake and interactions between trace minerals, some dietary *trans* fatty acids, water supply, etc. It is recommended to work with your private consultant to identify all the possible causes of this problem. Remember that any improvement in the efficiency of milk yield and its composition represent more net income, and also lower excretion of nutrients to the environment.