

Dairy

Absorption Of Colostral Immunoglobulins By Newborn Calves

L. J. Bush and M. B. Mungle

An experiment designed to quantify the relationship between immunoglobulin (Ig) intake and level of passive immunity attained in calves during early life is nearing completion. To date, data has been obtained on 26 calves. Three separate batches of pooled colostrum having different concentrations of Ig are being fed at two levels to different calves. In addition to determination of total blood serum Ig, specific fractions of the Ig are to be measured.

Another phase of the same project involves an examination of factors affecting Ig level in colostrum. Serial samples of colostrum taken immediately after parturition are being used for this analysis.

Methods of Processing Grain for Lactating Dairy Cows

B. J. Steevens and L. J. Bush

The importance of processing sorghum grain to the extent of breaking the kernels by grinding or rolling has been well established; however, the most optimum particle size has not been clearly defined. Therefore, the first part of this experiment is concerned with grinding sorghum grain (milo) for lactating dairy cows. A 50:50 ratio of concentrate to hay was fed to 36 Holstein and Ayrshire cows with the concentrate portion consisting of 70 percent milo. The milo was ground to the various degrees of fineness as follows: (a) very fine, (b) fine and (c) medium.

The response criteria were total milk production and composition, rumen volatile fatty acids, body weight changes and apparent digestibility of the major components of the ration. All data except the starch digestibility of the ration have been collected and are currently being prepared for analysis with the aid of the computer. The grain ration was

of a fine consistency but all cows readily consumed their allotted portion. Milk production was maintained at a high level and the composition was normal for the respective breeds. Sample analysis will be completed shortly after which comparative results will be available.

A later portion of the experiment involves feeding lactating dairy cows micronized sorghum grain to see if this is an advantageous processing method with respect to milk yield and composition and ration digestibility.

The Effect of Rate of Freezing on Sperm Cell Characteristics

Mark Hodson, Steven Fancy and Milton Wells

Freezing sperm cells in liquid nitrogen (-320°F) is the usual method used to store and maintain cells for extended periods of time. This freezing process causes the death of a high percentage (30 percent-60 percent) of sperm cells. This loss is compensated for by starting with sufficient cells to assure adequate numbers for fertilization in the delivered ampule.

A study is underway to determine the effect of rate of freezing on sperm cell characteristics, particularly, the integrity of the acrosome. Approximately 45 ejaculates from six bulls are being subjected to rates of freezing varying from extremely slow, $.25-.50^{\circ}\text{C}$ per minute, to extremely fast, $15-20^{\circ}\text{C}$ per minute, with the control rate, $3-5^{\circ}\text{C}$ per minute, being that currently generally recommended as being the most desirable way to freeze bull sperm cells.

Preliminary results to date indicate that the rate of freezing can definitely affect the condition of the acrosome. The excessively slow rate and the excessively fast rate seem to be the most harmful to cells. This study will be completed this year and complete analyses of the data should reveal the most desirable way to freeze semen. The results should yield information on ways to decrease losses of cells in the freezing process and thereby increase the utilization of the sperm cell production capacity of our highly desirable bulls.

Yeast Cultivation

J. B. Mickle and N. S. Knight

As the world's population continues to grow, it's logical to expect additional pressures on the animal industry for waste disposal. At present, over 14 billion pounds of whey are produced in the United States each year. Less than 30 percent of this is used and the remaining 70 percent is dumped.

Processing whey directly into animal feeds is not entirely satisfactory since the high lactose content often upsets the animals' digestive system. However, this milk sugar (lactose) can be converted into suitable nutrients by yeast and in the process most of biological oxygen demand of the whey is used. Yeast can use a variety of carbon sources, thus it also can be grown on animal wastes. However, the experimental work with whey and sewage substrates is fragmentary and there is much left to be done before this process can have wide commercial acceptance.

Algae have been grown on sewage at a cost of $\frac{1}{2}$ cent a pound. Thus it would appear that there might be a market for yeast grown

Thus it would appear that there might be a market for yeast grown on animal wastes to be used as a protein feed supplement since the amino acid composition of certain yeasts fit the minimum requirements of a protein supplement for some animals.

The research at O.S.U. is aimed at finding yeast strains which will produce the amount of fat and protein necessary for an animal feed supplement and finding an efficient way of cultivating these. Presently, three yeast strains are being used as pure cultures. It is anticipated that other organisms will be tried in the future and an effort will be made to find groups of organisms which grow well together.
