

# CALVING EASE

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Sam Leadley, Attica Veterinary Associates P.C.

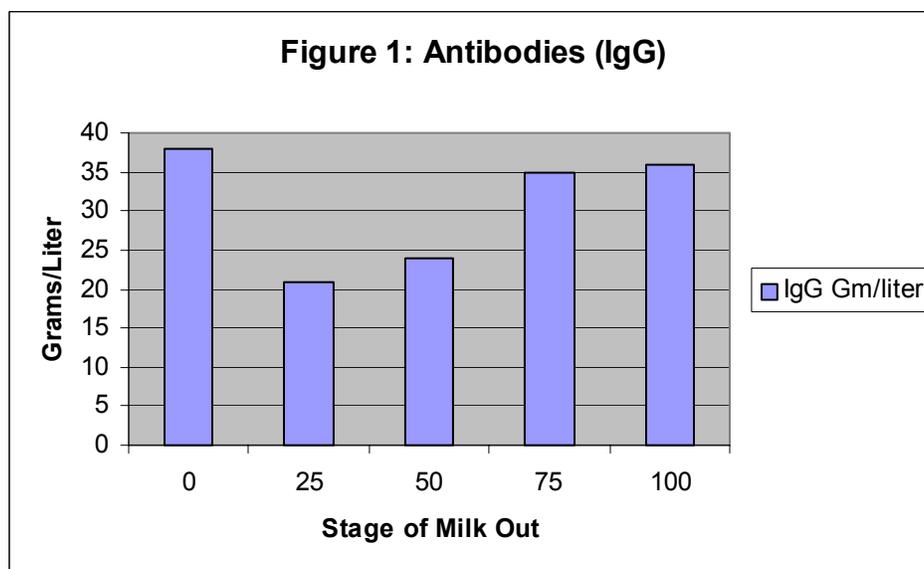
## Colostrum Composition And Stage of Milk Out

In an innovative research design a team sampled colostrum during milk out in sixteen cows. They started with a “cisternal sample” – stripped from the quarter before any stimulation. Then, from each pint of colostrum as it was harvested they drew a sample. In this way, regardless of the amount of colostrum the cow gave, there was a sample for every pint throughout milking.

They selected samples for analysis at 25, 50, 75 and 100 percent of milk out. Interpretation of these finding is limited by the team’s decision to use second milking rather than first for the study. The trends in the figures below should be the same for both first and second milkings. However, the antibody and fat levels are lower for second compared to first milking.

### Antibody Concentration by Stage of Milk Out

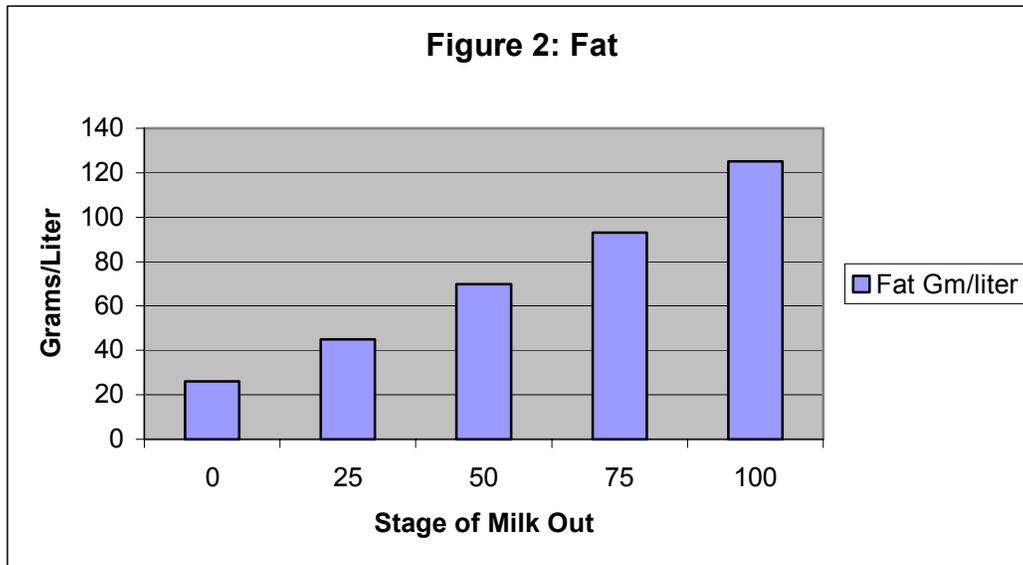
The samples were analyzed for many components. Of special interest for calf immunity and nutrition were the antibody (IgG) and fat levels. Notice in Figure 1 how the antibody (IgG)



concentration varies by stage of milk out. During the initial flush of milk release (25 percent milk out), the dilution rate is high. These data emphasize the importance of thorough milk out of fresh animals.

## Fat Concentration by Stage of Milk Out

In addition to antibody concentration, each sample was analyzed for fat content.



It is easy to follow the regular increase in fat content during the milking process as shown in Figure 2: Fat. Not so obvious is the amount of the increase. Compare fat concentration at the beginning of milking (milk in the teat cistern) of 3.3 percent to the concentrations at the other stages (5.8 percent, 10.1 percent, 15.9 percent and 26.1 percent respectively). We actually harvest most of the energy (fat) in the latter half of the milking.

### Another Nutrition Fact

When feeding any liquid feed we know that its dry matter content determines the overall nutritional value for the animal. The zero value (cisternal sample) was similar to milk; that is, about 12.5 percent dry matter or solids. The solids content increased slowly through 25 and 50 percent milk out (up to 14.4 percent). However, by 75 percent milk out the solids had jumped to over 17. By the end of milking the solids content had gone up to 21 percent!

Now, remember this was the second milking. These values are probably about ten percent lower than first milking with a resulting composite of 25 percent dry matter for first milking colostrum. Regardless of the absolute values, the message is in the rate of increase as the cow is milked out. It is likely that two-thirds or more of the solids are harvested in the last half of the milking.

Therefore, until better data are available I conclude that the best quality colostrum including antibody, fat and dry matter concentration comes from the full, composite milking of a fresh cow.

Reference: Ontsouka, C.E., R. M. Bruckmaier and J.W. Blum, "Fractionized Milk Composition During Removal of Colostrum and Mature Milk" *Journal of Dairy Science* 86:2005-2011.

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