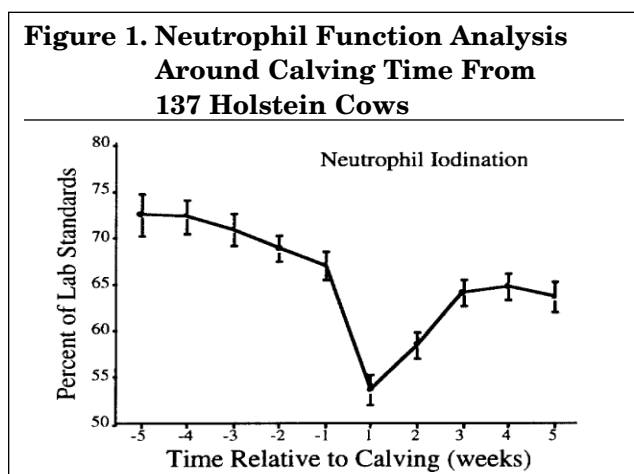




Association of Metabolic Diseases, Mastitis, And Immune Function In Transition Dairy Cows

Dairy producers are well aware that the old adage “When it rains, it pours!” is very applicable when it comes to describing problems with transition cows. Several epidemiological studies support the strong association between metabolic disorders in fresh cows and mastitis. A New York study involving 2,190 cows found that when fresh cows exhibited milk fever, they were 8.1 times more likely to have mastitis and 9.0 times more likely to have coliform mastitis. A survey of 772 herds in Sweden found that when cows experienced retained placentas, they were more likely to later have problems with mastitis. A study in England showed that retained placentas, twinning, dystocia, and lameness before first breeding all were associated with greater odds of having mastitis before first breeding.

The immune system of the dairy cow is severely depressed around the time of calving as illustrated by data from Kehrl et.al. at the USDA National Animal Disease Center, Ames, Iowa. (Figure 1.)



Since neutrophils are an important part of the immune system’s means of combating mammary infections, it is reasonable to conclude that the cow is more susceptible to infectious mastitis shortly after calving when neutrophil levels are low. It is

also reasonable to conclude that any conditions that retard recovery of the immune system would increase the cow’s chance of developing mastitis.

An experiment conducted at the USDA Nation Animal Disease Center in Ames, Iowa, compared the immune systems of normal cows with that of mastectomized cows. All cows exhibited a depression in immune function before they calved. However, after calving the immune function recovered quickly for the cows whose udders had been removed. Cows with intact udders did not show any recovery in their immune function during the entire study that lasted until 20 days postpartum. Eight of eight cows with intact udders experienced milk fever after calving, while none of the mastectomized cows were affected. Also, intact cows had elevated levels of NEFAs for 10 days or more postcalving while mastectomized cows only showed elevated levels for 1-2 days postcalving. This unique experiment demonstrates that the incidence of milk fever and ketosis are correlated with extended suppression of the immune system after calving.

The immune response may be required for the expulsion of the placenta after calving; therefore, retained placentas may be a result of suppressed immune function. This theory is backed by another USDA study in which 142 transition cows were monitored for immune function. Twenty percent of the cows retained their placentas after calving, and these 20 cows had significantly lower levels of neutrophils than their herdmates prior to calving.

Although all the “cause and effects” are not clearly understood yet, it is obvious that any management practices to reduce stress and proper nutrition to fortify the immune system during the transition period will help reduce both metabolic disorders and mastitis.