Dairy Split Session I

Quality Milk Production

Dr. Dave McClary, *Presiding*

Quality Milk Production: Case Reports A Milk Quality Problem Related to Elevated Standard Plate Counts in a Dairy Herd

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During the late spring of 1981 the Large Animal Clinic, Auburn University was working with a 160 lactating cow herd in east Alabama on a chronic subclinical mastitis problem. During the previous 6 months the herd had experienced numerous high Somatic Cell Counts (SCC). Wisconsin Mastitis Test (WMT) scores had ranged from 16 to 20 mm with Direct Microscopic Somatic Cell Counts (DMSCC) ranging from 750,000 to 900,000 cells/ml. During the same period bulk tank Standard Plate Counts (SPC) had ranged from 10,000 to 20,000 Colony Forming Units (CFU)/ml. Although these scores were within legal health department standards for that time they were well above our goals for quality milk of <300,000 cells/ml (WMT 5) and <5000 CFU/ml. The herd was experiencing approximately 3 clinical cases of mastitis per month (2%/mo.) which is not an excessive incidence.

An on farm evaluation including examination of facilities, observation of cow environment, analysis of milking equipment, examination of milking technique, and evaluation of treatment procedures for lactating and dry cows was conducted. Numerous problems and deficiencies were noted in several areas. Appropriate recommendations were made in an attempt to correct those problem areas.

Fifty four cows with elevated somatic cell counts on the most recent DHIA report were quarter sampled. The milk samples were submitted to the State Diagnostic Laboratory for culturing. A bulk tank sample was also collected and submitted to the laboratory. Of the 54 cows (207 quarters) collected, 25 cows (46 quarters) cultured positive for a coagulase positive staphylococci *(Staphylococcus aureus).* Four cows (5 quarters) cultured positive for a Camp negative streptococci. Coagulase positive *Staph* and *Strep nonags* were also isolated from the tank sample.

While formulating a plan for handling the subclinical staphylococcal mastitis problem, the July health department report was received. The report indicated that the bulk tank milk had an SPC of 110,000 CFU/ml. Elevated SPCs are usually not seen with subclinical staphylococcal mastitis problems.

Standard plate counts of >100,000 CFU/ml are most commonly associated with problems outside of the cows. Problems such as inadequate refrigeration of tank milk, poor sanitation of milking equipment, and incomplete premilking preparation of dirty udders are commonly associated with extremely high SPCs. Herd mastitis problems caused by *Streptococcus agalatiae* or *Prototheca* can cause high bulk tank SPC in some cases since these microorganisms are shed in high numbers by infected cows.

Further evaluation of the operation revealed inadequate cleaning of the system. Milk films and residues were found on numerous milk contact surfaces including the interior of the claws, milk flow rate sensor chambers and weigh jars. The poor cleaning was due to a faulty hot water heater which was not adequately heating wash water and an inadequate volume of wash water. The cleaning problems were further complicated by milkers occasionally forgetting to shut-off the cold water supply to a plate cooler in the system, thereby cooling the wash water during the wash cycle. After correcting these problems and completing a thorough cleansing of the system, it was felt the source of the SPC problem was eliminated.

It was quite surprising when the August health department report arrived showing an SPC of 1,000,000 CFU/ml. Again the operation was evaluated for sanitation of the system, milking procedure, and refrigeration. No major problems were noted. Then, while at a total loss for an explanation for the cause of the high SPC, the owner made the off-hand comment that the health inspector had been collecting milk samples from the milk valve in the bottom of the 1500 gallon "vat type" bulk tank. Further

questioning revealed that the milkers had been routinely opening the valve to obtain cold milk from the tank. Draining milk through the valve allowed a small volume of milk to be trapped inside the valve but outside the cooling portion of the tank. The milk film inside the valve was incubating at high ambient temperatures for several hours. When the health inspector collected a small sample from the tank through the valve, a large number of microorganisms were flushed into the sample bag. Bacterial counts on samples taken from the top of the tank following agitation of the tank milk compared to samples taken from the milk valve gave the following results: Samples from the top of the tank 20,000 CFU/ml, samples from the tank valve 2,000,000 CFU/ml. The State Health Department was informed of these findings. Collection of samples by the proper sampling technique resulted in no further SPC problems.

Abstracts

Haematogenous osteomyelitis in cattle

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The examination of 70 cattle with haematogenous osteomyelitis resulted in the classification of the bone lesions into two main groups: the physeal type, in which an infection, usually of metaphyseal bone, originated at or near the growth plate, usually in the distal metacarpus, metatarsus, radius or tibia, and the epiphyseal type, in which an infection originated near the junction of the subchondral bone and the immature epiphyseal joint cartilage, most often in the distal femoral condyle epiphysis, the patella and the distal radius. Combinations of physeal and epiphyseal defects and even diaphyseal involvement were occasionally seen. Epiphyseal osteomyelitis was mostly caused by salmonella infection, physeal by *Corynebacterium pyogenes*, salmonella and other bacteria. The salmonella affected animals were with one exception less than 12 weeks old and the majority had had some previous illness or came from a problem herd. The *C pyogenes* affected calves were in almost all cases more than six months old. The prognosis of the metaphyseal infection was in general satisfactory, and surgical intervention (osteotomy or sequestrectomy) was often required. The prognosis of the epiphyseal type was grave but two of the three animals in which physeal and epiphyseal defects were accompanied by diaphyseal lesions recovered.

A reassessment of the dual vaccine against rinderpest and contagious bovine pleuropneumonia

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In the light of the recent outbreaks of rinderpest in Africa a further assessment of the efficacy of the simultaneous inoculation of rinderpest virus vaccine and contagious bovine pleuropneumonia vaccine was undertaken. Groups of cattle were inoculated with a dual preparation of rinderpest vaccine virus and *Mycoplasma mycoides* subspecies *mycoides* or *M mycoides* alone. These groups were then challenged with *M mycoides*, first unsuccessfully by an in-contact challenge method and then by subcutaneous challenge. All animals were examined clinically after challenge for evidence of contagious bovine pleuropneumonia and serologically for rinderpest virus and *M mycoides mycoides* antibodies. There was no evidence that the serological response to the dual vaccine was in any way less than that to either agent given alone and no clinical disease was detected in these animals after in-contact challenge. However, after subcutaneous challenge, the dual vaccinated groups reacted similarly to an unvaccinated control group and unlike the group vaccinated only with *M mycoides*. This would indicate that the rinderpest virus component of the dual vaccine interfered with the ability of the *M mycoides* component to induce a fully effective immune response. In the pan African rinderpest campaign the use of the dual vaccine in areas where contagious bovine pleuropneumonia occurs should be carefully considered; in areas where the disease does not occur it is contraindicated.