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WELFARE QUESTIONS RELATED TO DIARRHOEA IN SUCKLING CALVES

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According to the Five Freedoms (FAWC, 1992, 1993), animals should not suffer from pain, injuries and diseases, and suitable prevention and/or rapid diagnosis and treatment should be in place. The welfare assessment protocols developed within the framework of the Welfare Quality® project include the health status of the animal. Thus, health is an important component of welfare and all diseases cause some degree of discomfort to the animal.

DIARRHOEA CAUSES WELFARE PROBLEMS AND ECONOMICAL LOSSES

Neonatal diarrhoea in calves is characterized by the acute appearance of loose or watery faeces. It affects between 10 and 35% of suckling calves and is responsible for more than 50% of pre-weaning losses. Diarrhoea causes lethargy and a gradual loss of appetite and growth, and can reduce the average daily weight gain by up to 0.03 kg. Also, several long-term consequences of diarrhoea have been described in replacement heifers, including an increase in the age at first calving and a decrease in milk production during the first lactation. Overall, diarrhoea in calves causes welfare problems and serious economical losses that can be reduced with adequate prevention and treatment.

CAUSATIVE AGENTS

The cause of diarrhoea can be infectious or nutritional. Infectious diarrhoea is caused by viral (rotavirus, coronavirus), bacterial (Escherichia coli, Salmonella spp.) and parasitic (coccidiosis, Cryptosporidium parvum) agents that can act independently or simultaneously. These pathogens cause damage to the intestinal tract through the destruction and detachment of enterocytes, atrophy of the villi, and inflammation of the submucosa. Nutritional diarrhoea is normally due to poor stockmanship and inadequate administration of the milk replacer.

WELFARE INDICATORS RELATED TO DIARRHOEA IN SUCKLING CALVES

After one or two days calves with diarrhoea can become dehydrated and lose between 5 and 12% of their body weight. As the calves become dehydrated, their clinical signs (sunken eyes, low skin elasticity, dry mouth and nose, cold limbs and ears) are more pronounced and can cause death.

Diarrhoea in calves causes sickness behaviour, which includes physiological and behavioural changes in the affected animals. Sickness behaviour is mediated by the effect of pro-inflammatory cytokines on the Central Nervous System and the immune system. Sickness behaviour is an adaptive strategy that increases the efficacy of the immune response as it allows the animal to use its energy resources to fight back the disease. Calves with diarrhoea show lethargy, somnolence, and loss of appetite and thirst, and they may be more reluctant than usual to approach the stockperson. Also, sick calves decrease their general physical activity and lie down for periods longer than normal, reduce their self-grooming behaviour and interact less with other animals.

In healthy calves, the estimated lower critical temperature (LCT, the temperature below which an animal must use energy to maintain its normal body temperature) is approximately 10°C. In calves suffering from diarrhoea, food malabsorption increases the LCT, and they are thus more susceptible to cold temperatures. As a consequence, trembling can be frequently seen. A change in resting behaviour has also been described, at least in small calves, and calves suffering from diarrhoea can be seen more frequently with their limbs under their body and their head resting to one side. This posture allows the animal to reduce its body surface and therefore to decrease the loss of body heat.

Sickness behaviour also involves a negative emotional state, including depression, pain and anhedonia (loss of interest or reactivity to usually pleasant stimuli). Diarrhoea can be accompanied by pain, and calves suffering from diarrhoea adopt a pain-relieving posture, with a tucked up abdomen and the tail between the rear legs whilst they are standing. In severe cases of diarrhoea, the calf will stand with its head and neck under the chest, which is indicative of severe discomfort.

"Diarrhoea can cause lethargy, discomfort and pain in suckling calves."

PREVENTION AND HUSBANDRY RECOMMENDATIONS

The prevention of diarrhoea includes general husbandry recommendations such as to ensure adequate intake of colostrum and provide optimal hygienic conditions and appropriate housing. Also, it is important to minimize stressful conditions such as rough handling, transport or mixing of unacquainted animals as stress may increase the susceptibility of animals to infectious agents. Moreover,

stress may inhibit the cellular immune response and as a result of this it may delay the recovery of the affected animals. It is important to remember that the effects of stress are additive and therefore the negative effects of stress on health with be more pronounced when several stressors impinge upon the animal simultaneously.

Traditionally, it has been advised that suckling calves are fed a daily amount of milk replacer equivalent to 10% of their body weight in order to promote feed consumption and allow early weaning. More recently, however, it has been recommended to increase milk replacer intake to an amount equivalent to 20% of body weight in order to avoid chronic hunger and reduce the incidence of disease. It is also recommended to feed calves using nipples, so that they can show their normal suckling reflex that will allow the milk replacer to go directly into the abomasum. This in turn improves the absorption of nutrients and reduces the risk of diarrhoea. Finally, calves must have permanent access to clean fresh water.

TREATMENT

Sick animals must be separated from the rest of the group and taken to hospital pens to be treated properly. Hospital pens have to be clean, dry and protected from inclement weather.

Fluid therapy is essential to maintain water, electrolyte and energy balance, which are critical factors for the survival of calves with diarrhoea. Also, pharmacological treatment addressed to the causative organism and to the lesions in the digestive tract is recommended. This includes the use of antibiotics, intestinal motility modifiers and gastrointestinal protectors. More recently, the administration of a non-steroidal anti-inflammatory drug (NSAID) to reduce discomfort and sickness behaviour is increasingly included as part of the treatment. In particular, the administration of meloxicam at the onset of diarrhoea is an effective supportive therapy, because it improves the recovery of the animals and reduces pain. In particular, a significant improvement in hydration status and faecal consistency, a reduction in rectal temperature and a reduced need for repeated treatment with antibiotic or oral electrolytes are seen in calves receiving meloxicam. Furthermore, meloxicam is effective to mitigate sickness behaviour and treated calves show an increase in general activity and milk, water and feed intake. Finally, treatment with meloxicam has productive benefits, as treated calves grow faster and can be weaned earlier than calves that do not receive meloxicam.

SUMMARY

Diarrhoea in suckling calves causes welfare problems and economic losses. Sickness behaviour, increased susceptibility to cold temperatures and abdominal pain are clear indicators of poor welfare. Key prevention measures include reducing stress and improving nutritional management. Together with fluid replacement therapy, meloxicam administration appears to be an effective supportive therapy as it reduces pain and accelerates the recovery of the treated calves.

Calf in a dry straw bed in order to avoid heat loss, especially through its limbs, during the treatment of diarrhoea.

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