Cattle Welfare

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Social housing of dairy calves: Why, when, and how?

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A shift if mindset around dairy calf housing has occurred in recent years. For many years, individually housing of calves in individual pens or hutches was viewed as optimal, and nearly exclusively used in the dairy industry. Some of the cited advantages of individual housing include reduced pathogen spread from animal to animal, and increased opportunity for individual monitoring and management. While elements of those things may merit, we also know that individual calf feeding and management can be labour intense and limits social contact for calves, which may negatively affect calf behavioural development and welfare. A large body of literature now exists to demonstrate that social housing of calves, in pairs or groups, may have several short- and long-term benefits; these include: improve social skills and cognition, decreased stress, earlier and greater solid feed intake (particularly at weaning), and greater growth. There is empirical evidence that these benefits are greater the earlier in life calves are exposed to social housing. As result, more and more adoption of social housing of dairy calves is occurring throughout the industry. Despite these benefits, challenges may also occur with social housing, including potential for cross-sucking as well as increased health concerns. While potential for these challenges exist, they need not to with good nutrition, housing, and management.

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Managing automated milking herds to optimize health and welfare

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The use of automated (robotic) milking systems (AMS) brings several opportunities for dairy producers with respect to cow health and welfare. There may also be situations where health and welfare challenges arise with adoption and use of AMS. Some of these challenges may result from cows not milking voluntarily, and thus achieving adequate milking frequencies at regular intervals. This is often the result of situations where voluntary milking behavior is impeded, specifically when cows cannot milk when they want to, or when cows do not want to go milk (often related to cows experiencing lameness). These situations are highly influenced by housing and management in AMS barns. Udder health may pose a challenge in AMS, however, data would suggest that it need not be. Further, we have opportunities to improve udder health and cow welfare at the end of lactation through proper dry off management in AMS. While AMS provide greater opportunity for managing nutrition at the cow level, there are situations where imbalances may occur, increasing the risk of metabolic disease including ketosis. Overall, to address these challenges no only are milking and feed management important in AMS herds, bedding and hygiene must be also be well managed to maintain good hoof health, cow hygiene, body condition, and cow comfort. Finally, in addition to being able to preventatively manage many of these potential challenges, there are also many technologies and associated data in AMS that provide increased opportunities to monitor, manage, and improve cow health.

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Pain assessment and management in cows and calves – Part I

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Animal welfare is an essential element of modern animal production. First and foremost, animal welfare is grounded on ethical concerns that derive from the fact that animals are sentient beings, i.e. able to suffer and experience emotions.

Societal concern over the welfare of farm animals has increased recently and a growing number of citizens in many countries now demand that farm animals are reared, transported and slaughtered as humanely as possible. For example, according to a survey done in 2015 and involving more than 27.000 citizens from the 28 Member States of the European Union, 94 % of them think that it is important to protect the welfare of farm animals. Interestingly, this percentage ranged from 86 and 99 %, showing that even in the EU countries that are supposedly less concerned about the welfare of animals, a clear majority of citizens believe that it should be protected.

Improving animal welfare may have additional benefits. As many welfare problems have a detrimental effect on production, improving the welfare of farm animals very often has positive effects on performance. Also, improving animal welfare is one of the strategies that may contribute to reduce the use of antimicrobials in fam animals.

It is widely accepted that animal welfare encompasses not only the physical health of the animals (i.e. the absence of diseases and injuries) but also their behaviour and emotions. Pain is not only a consequence of several diseases and injuries, but also an aversive emotional experience that often interferes with the expression of normal behaviour. As such, pain is a major welfare issue in farm animals in general, including cows and calves. Therefore, pain prevention and management are key aspects of animal welfare improvement strategies.

This paper will be divided into two sections. In the first section, the principles of pain assessment in animals as well as the economic consequences of pain will be reviewed. The second section will address the major causes of pain in cows and calves. In addition, the general principles underlying some of the strategies to prevent such causes will be discussed.

Pain includes a sensory and an emotional component, the latter being particularly important from an animal welfare standpoint. As emotions are not easily measured in animals, pain assessment is difficult. Indeed, the gold standard of pain assessment in humans is self-reporting, which is not possible in animals. Although there are several physiological indicators that can be used to assess pain or inflammation in animals, including for example plasma concentration of cortisol and acute phase proteins, these are mainly useful in an experimental setting and are not feasible in field conditions. Indeed, assessment of pain in animals in field conditions is mainly based on the observation of behavioural changes. Some behavioural changes will appear regardless of the cause of pain and these include a reduction in feed intake and rumination; licking, rubbing or scratching painful areas; grinding teeth; altered social interactions, and changes in posture to avoid moving or causing contact to a painful body area. Scores based on facial expressions were originally developed to assess pain in laboratory animals and have more recently been developed for some farm species. These scores have been shown to be valid and reliable tools to assess pain and have the advantage of requiring minimal training.

There is growing evidence that pain in farm animals has negative consequences on production efficiency and economic profit. For example, work done in dairy cows has shown that the administration of an anti-inflammatory drug with analgesic properties to cows with mastitis in addition to the usual antibiotic therapy reduces subsequent culling rate. Although the mechanisms underlying this effect are not properly understood, it has been suggested that it may be due to the negative effects of pain on fertility. Similar beneficial effects of NSAIDs in calves with respiratory problems have been found. Studies carried out in several species suggest that preventing pain caused by parturition has positive effects on both the dam and the offspring.

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Pain assessment and management in cows and calves – Part II

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Pain in farm animals can be caused by diseases and injuries, husbandry practices, and parturition. Mastitis and foot problems leading to lameness are among the main painful conditions in dairy cows. Hyperalgesia (i.e. an increased sensitivity to pain) has been described in farm animals because of painful conditions such as lameness and mastitis.

Research has shown that all clinical mastitis, including grade I mastitis (i.e. those that result in changes in the aspect of milk only) are painful. For example, it has been shown that cows with mild and moderate mastitis have significantly larger hock-to-hock distances compared with healthy cows, suggesting that they modify their stance to reduce pressure on the udder. Moreover, increased restlessness during milking, including a high frequency of kicking and stepping, has been observed for at least 3 days after mastitis detection.

Animals with foot conditions suffer long-lasting pain that may commence well before lameness is apparent. Although different locomotion scoring systems have been developed for routine use by farmers, it should be noted that lameness is usually underreported by producers. Signs such as head bobbing, arching of the spine and changes in stride length allow a rapid identification of lame individuals.

Management of pain caused by mastitis and foot conditions includes both the appropriate use of analgesia and anaesthesia as well as changes in management and husbandry that reduce the risk of mastitis and lameness. The link between animal welfare and animal health (including the absence of conditions such as mastitis and lameness) includes several aspects. As health is an important part of welfare, medical conditions must be considered as welfare problems. Additionally, many welfare problems that are not directly related to physical health have an important effect on the risk of animals developing medical conditions such as mastitis and lameness. This is partly due to the fact that chronic stress (which is a welfare problem) may cause immunodepression. Also, many welfare issues related to housing and behaviour (including for example thermal and physical discomfort, negative social interactions between animals and poor human-animal relationship, among others) may have a direct effect on the risk of animals developing lameness and mastitis.

Some of the main painful husbandry practices in cows and dairy calves are tail docking, disbudding and dehorning. The alleged benefits of these practices should be weighed against their negative effects on animal. Tail docking provides a good example to illustrate this principle. For example, dairy cows are oftentimes tail docked based on the assumption that tail docking reduces the risk of mastitis; however, there is no scientific evidence at all that supports this assumption.

Disbudding and dehorning are always painful, regardless of the method used and the age of the animals. Moreover, there is now evidence that pain caused by disbudding may result in negative cognitive bias in calves, i.e. calves will judge a neutral stimulus as being negative. Cognitive bias is considered to be a useful indicator of the general emotional state of the animals, and the effects of disbudding on cognitive bias illustrate the far-reaching consequences that this practice -if not done with appropriate analgesia and anaesthesia- may have on the welfare of the animals. Also, the experience of pain very early in life may have long-lasting consequences in pain sensitivity and there is now evidence that animals that suffer pain shortly after birth may remain more sensitive to subsequent pain for a long period.

It is well accepted that dystocia results in pain in both the dam and the offspring. Whether normal parturition is also painful is less clear. However, even after normal parturition, plasma levels of haptoglobin remain higher than normal for at least 15 days in heifers and 4 days in cows. Haptoglobin is an acute phase protein that increases because of tissue damage and inflammation.