ASSESSING THE WELFARE STATUS OF NEWBORN FARM ANIMALS

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Abstract *Animal Welfare 2003, **12**: 695-698*

Although major progress has been made during the last 50 years in understanding the causes of, and devising methods to minimise, neonatal mortality and morbidity in farm animals, almost all of this progress has been made without an explicit animal welfare focus. Nevertheless, knowledgeable intervention at birth now markedly reduces the total amount of animal welfare compromise that would otherwise occur. In assessing the degree of welfare compromise in other contexts three orientations are apparent. These emphasise biological function, affective state and natural living. In the present paper the significance of these orientations in an assessment of welfare compromise in newborn lambs, kids, calves, deer calves, foals and piglets, conducted previously, is examined. It is concluded that: 1) it was appropriate to emphasise biological function during the research which improved the management of newborns, but this emphasis was not sufficient to characterise the nature and degree of welfare compromise the newborn might experience; 2) a focus on affective state, and particularly on noxious sensations, more appropriately allowed an initial assignment of different degrees of compromise caused by neonatal breathlessness, hypoxia, hunger, sickness and pain; and 3) the notion that farm animals should be left to fend for themselves in a natural state at the time of birth when knowledgeable intervention would markedly reduce neonatal suffering contradicts our duty to care for the animals in our control. Finally, on-farm assessments of neonatal welfare compromise would be possible, but they would need to allow for the prevalence and severity of each condition, which can vary widely depending on the species and local circumstances.

Keywords: *affective state, animal welfare, biological function, natural living, neonatal welfare assessment*

Introduction

Much has been learnt during the last 50 years about the causes of neonatal mortality and morbidity and about practical means for minimising them in newborn lambs, kids, calves, deer calves, foals and piglets (Mellor & Stafford 2003). The major causes of problems in these newborns include hypothermia resulting from excessive heat loss or from hypoxia-induced, starvation-induced or other forms of inhibited heat production. The problems also include maternal undernutrition, mismothering, infection and injury. The published literature reveals that the scientific investigations which clarified these causes and led to practical

means for minimising the problems involved iterative successions of self-reinforcing laboratory and field investigations conducted over many years (Mellor & Stafford 2003). These studies focused largely on solutions to the problems, not on the suffering that the newborn might experience. Accordingly, the animal welfare compromise that the newborn may experience before death, or during sickness, had not apparently been analysed until Mellor and Stafford (2003) did so. As a good state of welfare is achieved when the nutritional, environmental, health, behavioural and mental needs of animals are met (Mellor & Stafford 2001), and as an animal's subjective experience of well-being, or suffering, is of major concern (Mellor & Stafford 2001), neonatal welfare assessments should focus on potentially noxious subjective experiences that the newborn may have. Mellor and Stafford (2003) showed that in the context of neonatal death or sickness, the key subjective experiences which require analysis in animal welfare terms are breathlessness, hypothermia, hunger, sickness and pain.

In his opening address to the present workshop, Fraser (2003; see pp 433–443, this issue) noted that views on the nature, or definition, of animal welfare tend to emphasise biological function, affective state or natural living, and that these different starting points can lead to the same data being interpreted in welfare terms in different ways. Accordingly, there appeared to be merit in exploring briefly how these three orientations might have played a part in the neonatal welfare assessment conducted by Mellor and Stafford (2003).

Biological function

Biological function was unquestionably the focus of almost all of the research which improved understanding of the causes and prevention of neonatal mortality and morbidity in farm animals over the last 50 years (Mellor & Stafford 2003). For instance, parameters of interest in the context of neonatal respiratory distress included blood gas tensions, physiological determinants of lung development and the control of respiration; for thermoregulation they included body core temperature, factors that enhance or reduce the rates of heat production and heat loss, and the sources of nutrients used to fuel heat production; for starvation they included survival times, plasma indices of energy status, the utilisation of body energy stores and hormonal responses to food deprivation; for infections they included sickness behaviours, fever, clinical manifestations of disease such as diarrhoea and pneumonia, and *post mortem* pathological findings; and for injuries they included contusions, bruising, fractures, guarding behaviour or restricted movement. The focus of this work was on using quantifiable indices to define physiological, pathophysiological or pathological states in the newborn in order to discover ways to avoid those states or to manipulate them beneficially. Using this approach, the rates of neonatal mortality and morbidity were markedly reduced and the welfare status of the newborn was correspondingly improved (Mellor & Stafford 2003). However, the improvement in welfare status was an incidental benefit because almost none of this work, most of which was completed before the mid-1980s, had an overt animal welfare purpose (Mellor & Stafford 2003).

Nevertheless, it is now possible to define the newborn functionally with respect to the presence or absence of desirable or undesirable states. If a good neonatal welfare status were defined, using quantifiable indices, in terms of the presence of normal physiology and/or the absence of pathophysiology or pathology, as noted by Fraser (2003; see pp 433–443, this issue), such an approach would be focused on biological function. For Mellor and Stafford (2003), however, such a focus did not seem to be adequate to encompass the suffering a newborn might experience.

Affective state

A good state of welfare is achieved when the nutritional, environmental, health, behavioural and mental needs of animals are met, with the animal's subjective experience of well-being or suffering being expressed though the mental domain (Mellor & Reid 1994; Mellor & Stafford 2001). The welfare assessment conducted by Mellor and Stafford (2003) therefore focused on potentially noxious subjective experiences the newborn may have, and their analysis revealed that the major ones are likely to be breathlessness, hypothermia, hunger, sickness and pain, and that two or more of these affective states may occur together. Reference to documented responses of farm animals and, where appropriate, to human experience, suggested that breathlessness and hypothermia usually represent less severe neonatal welfare insults than do hunger, sickness and pain (Mellor & Stafford 2003).

Natural state

Advocates of a natural state commonly imply or explicitly state that the welfare of animals would be better if human interference had not occurred or was to cease. In the natural state, without human intervention, it is quite normal for a high proportion of newborns to die from the major causes noted above. Indeed, 50 years ago average mortality rates in newborn farm animals of 30–50% or more were common, and in some parts of the world they still are (Mellor & Stafford 2003). With knowledgeable intervention, however, it is possible today to reduce these average mortality rates to 25%, and in some farmed species to much less. This represents a substantial reduction in the total amount of neonatal welfare compromise. Accordingly, it would be difficult to support a natural state perspective which required that such intervention should be avoided in order to safeguard newborn welfare by minimising human interference around birth, especially where it had been shown that the required intervention does help and is practically feasible. Indeed, in exercising our custodial responsibilities towards the animals in our care and control, it can be argued that intervening knowledgeably is a duty. That said, it should also be noted that some systems of low-input birth management which successfully reduce neonatal losses have also been developed (Fisher & Mellor 2002).

Neonatal animal welfare assessment at farm level

Mellor and Stafford (2003) ranked the different welfare insults that newborns may experience. In general, breathlessness and hypothermia were ranked somewhat lower as insults than were hunger, sickness and pain. This ranking may be used to assess the overall amount of welfare compromise experienced by newborn lambs, kids, calves, deer calves, foals and piglets. However, it would need to be used in conjunction with knowledge of the prevalence and severity of the related neonatal problems, and they would depend on the species, climate, birth environment (indoor, outdoor), management approach to pregnancy and birth (none, or low to moderate or high intervention), and other factors. For example, lambs born outdoors on rested pasture have a lower incidence of neonatal infections, but they are exposed to more severe cold challenge and starvation occurs more often than with lambs born indoors on deep litter (Fisher & Mellor 2002). However, with both indoor and outdoor lambing, infection and injury account for only a small proportion of neonatal losses (Alexander 1984; Alexander *et al* 1985; Eales & Small 1986), which, overall, would offset their higher ranking as welfare insults. Hypothermia remains the major factor in both

situations, but has a lower ranking as a welfare insult. Whatever the outcome of such assessments in each species, clearly a continuing commitment to minimising mortality, morbidity and other factors that compromise the welfare of the newborn is required on each farm.

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References

Alexander G 1984 Constraints to lamb survival. In: Lindsay D R and Pearse D T (eds) *Reproduction in Sheep* pp 199-209. Australian Academy of Science and Australian Wool Corporation: Canberra, Australia

Alexander G, Barker J D and Slee J (eds) 1985 *Agriculture: Factors Affecting the Survival of Newborn Lambs* pp 1-198. Commission of the European Communities: Luxembourg, EU

Eales A and Small J 1986 *Practical Lambing: A Guide to Veterinary Care at Lambing* pp 1-132. Longman: London, UK

Fisher M W and Mellor D J 2002 The welfare implications of shepherding during lambing in extensive New Zealand farming systems. *Animal Welfare 11*: 157-170

Fraser D 2003 Assessing animal welfare at the farm and group level: the interplay of science and values. *Proceedings of the 2nd International Workshop on the Assessment of Animal Welfare at Farm and Group Level. Animal Welfare 12*: 433-443

Mellor D J and Reid C S W 1994 Concepts of animal well-being and predicting the impact of procedures on experimental animals. In: *Improving the Well-Being of Animals in the Research Environment* pp 3-18. Australian and New Zealand Council for the Care of Animals in Research and Teaching: Glen Osmond, Australia

Mellor D J and Stafford K J 2001 Integrating practical, regulatory and ethical strategies for enhancing farm animal welfare. *Australian Veterinary Journal 79*: 762-768

Mellor D J and Stafford K J 2003 Animal welfare implications of neonatal mortality and morbidity in farm animals. *The Veterinary Journal* (in press)