The welfare of ostrich handling, transportation and slaughter

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One of the problems encountered in discussions of animal welfare is in deciding exactly what welfare means. An individual's welfare is defined to be its state as regards its attempts to cope with its environment. An ideal level of animal welfare is "a state of complete physical and mental health in which the animal is in harmony with its environment". Taken together, the two critical components of welfare – physical health and mental or psychological health of the animal - define the "quality of life" or level of welfare the animal experiences. Animal welfare refers to how well an animal is coping both with its environment and with the way it is being managed. When an animal's major needs are being met its welfare is good. Animal welfare science is a dynamic and growing discipline, especially in avian species. Recently ostrich production increased in many countries and welfare of this species is a new subject. The most common welfare problem occurs during catching, transport and slaughter of ostriches. These procedures results in stress and fear responses in the birds. The poor conditions can all be causes poor welfare. In this review is given some information about welfare in management practices for ostrich. In addition, the importance of welfare during handling, catching, transportation, stunning and slaughter of ostriches are also discussed.

Keywords: Welfare, handling, transportation, slaughter, ostrich

Introduction

Because of rising public concern about the care and treatment of animals, there has been increasing interest in the development of guidelines for animal welfare and husbandry in the agricultural sector (Mench and Swanson 2001).

Animal welfare concerns arise animal welfare concerns arise at four stages in animal production. 1) Animal welfare concerns can arise because of factors acting before the animal enters the production system. 2) Animal welfare concerns can arise while the animal while in the production system. 3) Animal welfare concerns can arise when the animal goes to slaughter – is it fit or is it crippled, injured or weak from lack of exercise. 4) Animal welfare concerns can arise at the slaughterplant (Halverson, 2001).

Recently ostrich production increased in many countries and welfare of this species is a new subject. The most common welfare problem occurs during catching, transport and slaughter of ostriches. These procedures results in stress and fear responses in the birds. The poor conditions can all be causes poor welfare. In this review is given some information about welfare in management practices for ostrich. In addition, the importance of welfare during handling, catching, transportation, stunning and slaughter of ostriches are also discussed.

Some factors that influence on ostrich welfare

Light : It can be manipulated in four areas that may be helpful, including source, intensity, wavelength, and photoperiod (Manser 1996). In the literature available not much information was found about the intensity of light or length of daylight in the ostrich chick rearing. No model program has also been elaborated in this matter. However, for the first two days after moving the ostrich chicks from the hatcher to the brooder house, the light should be kept on for 24 hours a day. During the third and fourth day the number of light hours is decreased to 18 and on day five and six to 16 hours/day. Simultaneously, the light intensity is also decreased during the first days it reaches 90-100 lux, after 7 days 40 lux and after 14 days till the end of rearing 20-25 lux. The light is put out in the evening at 21.00 and put back on at 6.00 in the morning (Horbanczuk 2002).

Stocking Density : High stocking density is one of the major points that raise animal welfare concerns. A lack of sufficient space leads to leg deformities, feather pecking and clearly lowers productivity of the ostrich flock. The minimum floor space per one chick (until the end of eight weeks of age) ranges from 0.25 to 1 m^2 and 1-5 m^2 on the run (Kreibich and Sommer 1995).

Ammonia and Effects : At high rearing densities the litter may become easily wet as result of larger deposits of faecal content, spilled water and inadequate ventilation. Ammonia is a highly irritating and toxic gas (Kristensen and Wathes 2000). These two factors, ammonia and wet litter combined, are responsible for a large number of density related welfare problems in poultry, such as increasing incidence of contact dermatitis in broilers, turkeys, layers and ostrich kept in floor and of infectious and respiratory diseases and ascites (Carlile 1984; Kristensen and Wathes 2000; Horbanczuk 2002). To eliminate these problems it is recommended that ammonia levels should not exceed 20 ppm and for other toxic gasses; 3000 ppm for CO_2, 10 ppm for CO, 0.5 ppm for H_2S, 3.4 mg/m^3 for total dust and 1.7 mg/m^3 for inhalable dust (Wathes 1998). All the reviewed evidence suggest that exposure to ammonia concentrations of 60-70 ppm may cause keratoconjunctivitis (Lillie 1970; Quarles and Kling 1974). Keratoconjunctivitis may not only cause pain but also hunger and thirst because the bird's ability to find food and water may be reduced. Best management practices to maintain these ammonia levels include: use of diets that reduces the level of urea and proteins, maintain densities according with the ventilation capacity of the building, use litter material with high water holding capacity, and to minimize over drinking by provision of pecking substrates to the birds.

Reduced food intake during ammonia exposure may be attributable to several factors. Schiffman and Nagle (1992) suggest that aerial pollutants not only affect the chemical senses but also affect the blood flow to the tongue and interact with saliva. In ostrich during late autumn and winter the concentration of ammonia may become higher, as the birds spend less time outdoors, and on some days do not use runs at all (Wojcik and Horbanczuk 2000). The evidence of compensatory responses to ammonia exposure may indicate that the animals have to work harder to cope with their environment and thus be an indication of potentially compromised welfare (Broom and Jonhson 1993).

Other Problems: Close attention must be paid to prevention of infection, nutritional imbalance or inadequacies, avoidance of injury through poor management and inappropriate environmental conditions (Huchzermeyer 1999). Limb deformities are very common in ostrich chicks. The usual presentation is a progressive external rotation of one legs involving both the tibiotarsus and tersometatarsus (Stewart 1989). The development of tibiotarsal rotation was the most frequent cause of death, particularly in chicks more than 1-month age (More 1996). Bezuidenhout and Burger (1993) found that 6.3% incidence of tibiotarsal totation risk in chicks hatched over two seasons on an experimental farm in South Africa. The causes of tibiotarsal rotation are poorly understood (More 1996).

Catching and Transportation: The handling procedure results in stress and fear responses in the birds (Mills and Nicol 1990). To accomplish these goals often the catchers pay little attention to prevent physical damage to the birds, resulting in bruises, dislocated and broken hips, legs, and wings, and internal haemorrhage (Gregory and Wilkins 1992; Kristensen *et al.* 2001). Poor handling can

result in pain for the birds, and 40% of bruising found after slaughter is believed to occur during catching of the birds (Knowles and Broom 1990). Fractures in birds are likely to be painful, and pain might be even more intense when the birds are handle and during transportation (Newberry *et al.* 1999). The duration of transport between farm and slaughterhouse has been positively correlated with the prevalence of some carcass lesions (McEwen and Barbut 1992).

Ostrich handling should need extra attention. All handling should be gentle and considerate, and done by specially trained personnel. Appropriate training should include general biology and behaviour of ostrich, capture and handling, general management procedures, health controls, signs of disease and signs of stress and distress (Deeming *et al.* 1996). Care should be taken not to injure the vulnerable neck, and birds should not be held by a single leg or wing. Chemical restraint should not be routinely employed but hooding, particularly in fractious birds, is recommended (Perelman 1999).

There a number of factors involved with transportation of birds that cause a reduction in welfare for the birds. Motion, vibration, starting and stopping are stressful for birds (Nicol and Scott 1990; Mitchell and Kettlewell 1994). The welfare problems during transportation are mainly related to thermal stress, because the birds in the center of the truck birds tend to overheat, whereas the ones placed by the edge tend to suffer the weather inclemency the most. Provision of tarps to cover the sides of the truck during harsh weather conditions will help to minimize these effects (Newberry *et al.* 1999). Many lorries are still equipped with fixed containers and catchers are therefore obliged to carry birds in an inverted position over long distances. (Martrenchar 1999).

It is proposed that ostriches should be transported on closed vehicles with active ventilation to control the thermal environment. Payne (1993; 1994) reported that on a long flight (6.5 h) ostriches housed in purpose built wooden crates and with environmental temperature controlled to 18 °C generally travelled well with no obvious ill effects.

Such vehicles can maintain low light levels, which will calm the birds and will insulate them from external noise and visual images. Space allowances should reflect the age and size of the birds, ranging from 0.1 m^2 for 1-month-old birds to 0.75 m^2 for adults and birds may stand or sit during the journey as they wish. Chicks may be transported in groups of four to six per small crate compartment, and group sizes should be restricted to 12 and eight birds per pen for juvenile and adults birds, respectively. Ostriches should rest, in quiet surroundings, for at least 2 h prior to a journey. Water should be available up to departure, but withdrawal of food for periods of up to 4 h (10 h recommended in South Africa) may be desirable to reduce faecal contamination of the vehicle floor (which poses a risk of slipping and injury) and birds in transit (Mitchell 1999).

Stunning and Slaughter*:* The most common form of stunning of poultry at processing plants is water bath – electrical stunning. The current used is very important when examining welfare (Fletcher 2000). A minimum of 120 mA must be used to ensure unconsciousness (Raj 2000). Increasing currents result in reduction of the quality of meat (Hoen and Lankhaar 1999), hence other alternatives for stunning are being examined (Fletcher 2000).

The method that seems to be hold the most interest as a replacement for electrical stunning is gas stunning for both chickens and turkeys. This method actually results in death of the bird (Fletcher 2000). While care must be taken as to the composition of gases used. Gases used include O_2 and CO_2 mixtures, CO_2 and nitrogen combinations (Hoen and Lankhaar 1999), and argon-based gases (Fletcher 2000). Modified Atmosphere Killing Units (MAK) is being examined for on farm killing. These are contained units with gas tanks supplying an enclosed area (Webster *et al.* 1996). This method would eliminate the manual killing of the birds, and also the stresses placed on the birds during crating, transportation, waiting at the slaughter plant, and shackling.

The question of whether ostriches can be slaughtered humanely has been raised (Bertram 1993) and constitutes a major welfare issue. Whatever the method employed, it should cause immediate loss of consciousness rapidly rendering the animal insensible to pain and distress, or cause the death of an animal, which is anaesthetized or effectively stunned (Mitchell, 1999). According to manufacture's information ostriches are stunned for about 3 seconds at 90 Volt and 1 Ampere in South Africa. In France and Israel the birds get stunned at 250 Volts, which increases the reliability of the stunning process. The position of the electrodes should be eye – eye, or ear – ear, or eye – ear (Kreibich and Sommer 1995).

Then the ostriches are suspended by both legs by chains hanging from the end of an upturned horizontal bar and lifted to an upper floor. Bleeding which takes 7-10 minutes is carried out immediately by cutting the throat near to the head (Cooper 1996).

In conclusion, animal welfare science is a dynamic and growing dicipline. Animal welfare science thus studies animal needs and characteristics and discovers the critical attributes of the production environment that, when not provided, cause various degrees of distress and suffering to the animals and, when provided, help to ensure a positive welfare status. This information can be used to attempt to design production environments that are improvements over their predecessors in terms of providing for both the physical and mental well-being of the animal. This discussion demonstrates the inter-relationship of all the factors involved in ostrich welfare similar to other farming enterprises. Housing conditions, management practices, catching, transport and slaughtering can all be causes poor welfare. It is hoped that there will be more fundamental research which will examine the problems of ostrich production in a farming setting and thus facility in future improvements in commercial practices and systems, and therefore optimise the welfare of the birds.

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