POULTRY WELFARE STANDARDS AND GUIDELINES – ACCESS TO WATER FOR DUCKS

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ISSUE

Whether to provide open water sources for commercial ducks.

RATIONALE

Historically, duck production has frequently involved the provision of trough systems that complemented nipple drinking systems or provided stand-alone drinking water. These systems were traditionally external to the sheds or were constructed on concrete drains with a mesh system to enable leakage and spillage to flow to containment dams.

In the 1990s, nipple drinking systems were developed for commercial poultry that significantly reduced the amount of water leakage and spillage. These systems were then adapted to duck production to improve the management of water and litter moisture within the sheds. These new technologies were associated with highly significant improvements in litter management, reductions in mortality from bacterial disease and a marked improvement in the management practices for shed effluent.

More recent behavioural research has indicated that Pekin Ducks have a strong instinctive behaviour to dabble with surface water and undertake behaviours to immerse the beak and head in surface water (Jones et al., 2008). Initiatives in Europe have recommended that surface water technologies be reintroduced using either an 'in shed drain system' or an outside veranda system with accompanying drain.

Some studies have shown ducks have shown a preference for open water without prior experience, and have worked to obtain access to open water, indicating an innate need (Cooper et al., 2002; Heyn et al., 2006a; Heyn et al., 2006b). Water is required for ducks to perform many species-specific behaviours such as head dipping, wet preening, wing rubbing, and shaking movements (O'Driscoll and Broom, 2012; Heyn et al., 2009). Surface water and the provision of water immersion systems bring management challenges that impact on shed hygiene and litter conditions, and need to be managed precisely to achieve good health and production outcomes. The maintenance of friable litter is an important priority in maintaining bird health, hygiene and plumage condition. Surface water in a trough or the water immersion technology for ducks needs careful management to minimise litter moisture accumulation, and reduce risks of micro-organism ingestion with drinking water.

There has been some limited experimentation with surface water systems in Australia, but the industry needs additional time to evaluate technologies, including mister and shower systems for ducks, and learn from the European experience that appears more advanced. Not all objective information on these issues can be obtained from institutional research models that have a constrained focus on duck behaviour and do not thoroughly evaluate animal health issues.

If these technologies were to be adopted consideration would need to be given to establishing an understanding with the Environment Protection Authorities to facilitate the effluent management and some commitments on

planning provisions for new farms and farms that may require retro-fitting. Many existing planning approvals are contingent on having no water effluent/emissions from duck housing.

Water utilisation rates are expected to increase 100% with the adoption of these technologies (Rodenburg et al., 2005).

RECOMMENDATIONS

The drafting group considered current scientific knowledge and practice and agreed that one standard is required to underpin duck welfare, pertaining to

- facilities provided to allow ducks to dip their heads under water or
- misters/showers to allow ducks to wet preen, and to clean their eyes and nostrils .

ANIMAL HEALTH AND WELFARE CONSIDERATIONS

The clear difference between the Australian Model Code and the RSPCA UK Standards was the UK emphasis placed on the development of open water technology for husbandry of the Pekin Duck. Recent research undertaken in Europe illustrates the benefits of open water technologies for improving the behavioural repertoire of Pekin Ducks (Jones et al., 2008), but there is no accompanying research that defines the animal health or environmental consequences of moving from an essentially dry system to a wet system. Furthermore, the historical evolution of the intensive duck systems suggests that the movement to wet systems may be associated with increased mortality, poorer flock hygiene, and environmental issues associated with managing the effluent from surface water systems (Schenk et al., 2016).

Animal health issues associated with wetter litter, ingestion of contaminated drinking water and effluent management

An acute or chronic septicaemic disease, caused by *Riemerella anatipestifer*, affects ducks of any age. The organism is sometimes isolated from turkeys, chickens, game birds and waterfowl. Mortality is 2-75% in young ducks, and transmission is mainly direct, bird-to-bird, via toenail scratches, especially of the duckling foot, or through respiratory epithelium during respiratory disease. It can also be spread by faecal contamination of feed, water or the environment, where survival of the infectious agent may be prolonged. Adverse environmental conditions and pre-existing disease are predisposing factors.

Industry has associated wet and poor litter management with upsurges in mortality due to *Riemerella* infection and the transition to the nipple drinker technology has seen control of both acute and chronic infections significantly reduced. Food safety issues arising from the likely reduced shed hygiene associated with wetter litter, and the ingestion of non-potable water by the ducks, (Kuhnt et al., 2004; Rodenburg et al., 2005) are likely to be a significant constraint to the provision of open water facilities for ducks.

Increased water usage created by surface water and trough systems mean that any effluent produced would require containment, and external surface effluent ponds pose a significant biosecurity risk for the housed duck population. A technology would need to be developed that overcomes these issues.

Contemporary Australian Study undertaken on Commercial Farms (Pepe's Ducks, 2014)

A study undertaken by Pepe's Ducks in 2014 using grower (broiler) Pekin Ducks in Australia suggested a 63% increase in water utilisation in the sheds with the troughs and nipples compared to the nipples alone, and mortality increased by 81% in the sheds with troughs provided (Brown and Parkinson, pers. Comm. 2014)

WATER USAGE DATA

	Troughs & Nipples	Nipples
Litres of water used from day old to average age of 40.76 days	28.54	17.50

MORTALITY DATA

	Troughs	Nipples
Mortality from day old to average age of 40.76 days	2.74%	1.51%

*Data was collected from meat ducks grown from January 2014 to November 2014
*(Eighteen batches in total - nine batches with trough/nipple drinkers and nine batches with nipple drinkers)
Standard errors on data can be provided.

The findings of this study validate the patterns observed by industry, in the transition from surface water systems to the modern nipple drinker systems, and are consistent with the suggestions by researchers on the likely increases in water utilisation (De Buisonjé and Kiezebrink, 1999; Simantke, 2002; Rodenburg et al., 2005).

Schenk et al. (2016) found that the average total mortality for ducks housed with water troughs was higher at weeks 3, 4, and 5 ($P < 0.001$, $P = 0.04$, $P < 0.001$, respectively) compared with ducks housed with water lines. Similarly, the water trough treatment group had a greater average number of ducks found dead on weeks 3, 4, and 5 ($P < 0.001$, $P = 0.04$, $P = 0.04$, respectively) and there were more ducks culled in the water trough treatment group for weeks 3, 4, and 5 ($P < 0.001$, $P = 0.03$, $P < P < 0.001$, respectively). Overall, the percent total mortality was higher for ducks raised with water troughs compared to those housed with water lines ($P = 0.008$). Schenk et al. (2016) suggested that water troughs may not be beneficial for duck welfare and could adversely impact both environment and duck or human health. Porter et al. (2015) found water troughs contained an increased number of possibly pathogenic bacteria that may be harmful to both humans and ducks.

The duck industry in Australia has experimented with misting systems to allow ducks to perform some water-related behaviours. To date there is no published research on misting systems at a commercial scale that models the research approach undertaken by Schenk et al, 2016. However, during industry experiments with misting systems there was no significant increases in mortality (Brown and Parkinson, pers. Comm. 2016).

Plumage condition, nostril and eyes

When open water was supplied to Pekin Ducks, De Buisonjé and Kiezebrink (1999) found high levels of preening and a doubled use of water compared with nipple drinkers. This led to an increase of 100% in waste production and a poor litter quality.

Simantke (2002) suggested that ducks without open water often redirect their foraging behaviour to the straw, and their beak, nostrils, and eyes may become dirty as they are unable to clean them if open water is absent. The studies by Jones et al. (2008), also suggest that nipple drinkers are associated with an increased incidence of crusty and dirty eyes, and dirty nostrils and plumage. Some studies show access to open water to be important to improve and maintain eye and nostril health, as well as maintain plumage condition and cleanliness (Knierim et al., 2004; Jones et al., 2009; O'Driscoll and Broom, 2010; O'Driscoll and Broom, 2011).

Advice from Australian industry suggests that crusty eyes and dirty nostrils are at very low rates in commercial grower flocks and that plumage condition is most strongly correlated with litter moisture. Clearly an objective analysis of these issues in Australia would be worthwhile, particularly if the use of misting systems or trough systems could be compared to nipple only systems.

The Australian Duck Meat Association membership will establish a monitoring system for eye and nostril crusting, and for plumage condition (Parkinson, pers. Comm., 2016). This monitoring could be included in quality assurance programs at the abattoir level, and would provide evidence for the incidence and prevalence of these issues in commercial flocks, to inform development and adoption of new technologies (Parkinson, pers. Comm., 2016).

Wet litter and tissue scalding

Increased risks of tissue scalding (breast and hocks) have been reported for sheds with wet litter (moisture contents above 40%) (RSPCA UK, 2015).

Open water Systems

Simantke (2002) suggested some practical solutions to the problems of supplying ducks with open water. The water could be surrounded with plastic slats and the water could be cleaned and re-used, possibly using biofilters. Knierim et al. (2004) described equipment for continuous cleaning of the bathing/dabbling water which provides a satisfactory hygienic quality of the water. However, water loss during the cleaning process was considerable, as well as labour demands and costs.

Ahmed et al. (2015) examined the behavioural, productive and neuroendocrine responses of Muscovy Ducks to deprivation of a swimming pool. This study indicated that deprivation of swimming pool had no effect on the duck's behaviour (except feather pecking), performance, carcass characteristics and blood parameters of the experimental duckling. Ahmed et al. (2015) concluded a swimming pool is not essential at any stage of duck rearing.

CONCLUSIONS

Any new technology to enhance the immersion of the duck's heads in water, or provide showers/misters to improve the behavioural repertoire and body condition, will require a sophisticated technical solution that minimises entry of water and moisture to the shed litter material. The technology will also have to maintain water quality continuously, and have a capacity for recycling to meet environmental constraints. Surface water pondage is not an option due to biosecurity risks and effluent releases to the environment pose a significant constraint to farm establishment.

REVIEW OF NATIONAL POLICIES AND POSITIONS

Australian jurisdictions have no legislated provisions regarding open water for ducks.

The current Australian **Model Code of Practice for Poultry** 4th edition (2001) makes no recommendations regarding open water for ducks.

RSPCA Australia recommends that ducks are given access to water facilities to carry out their natural water-related behaviours.

The **Australian Veterinary Association** (AVA) has no specific policy regarding provision of open water for ducks.

REVIEW OF INTERNATIONAL POLICIES AND POSITIONS

RSPCA UK (2015) has promoted the adoption of surface water technology that can facilitate dabbling and possibly swimming. The guidelines recommended by RSPCA recommend changing surface water every 16 hours or twice in 24 hours.

The **American Veterinary Medical Association** has no policy regarding the provision of open water for ducks.

The **Canadian Agri-food Research Council** does not have a Code of Practice for ducks.

The **New Zealand** National Animal Welfare Advisory Committee does not have a Code of Welfare for ducks.

In the **United Kingdom,** the welfare of ducks and geese is protected by the general requirements of the Welfare of Farmed Animals (England) Regulations 2007. There is also a Code of Recommendations for the Welfare of Ducks, which continues to apply under the new Animal Welfare Act.

Code of Recommendations for the Welfare of Livestock: Domestic ducks and Muscovy ducks and their hybrids Published by the Department for Environment, Food and Rural Affairs (DEFRA). Printed in the UK, June 2004,

53. Provision of water for bathing

Where practicable, access to an outside run and water for bathing can assist ducks in meeting their biological requirements. It is accepted that in practice this cannot be provided for most birds and that there are risks to duck health, hygiene and safety if they are given unlimited access to open water. Ducks should be provided with water facilities sufficient in number and designed to allow water to cover the head and be taken up by the beak so that the duck can shake water over the body without difficulty. Where possible facilities should be provided to allow ducks to dip their heads under water.

54. Consideration should be given to the provision of water troughs or wide channelled bell drinkers as these allow opportunities for a wider range of water related activities.

In 2004 the Department for Environment, Food and Rural Affairs (DEFRA) in the UK was particularly interested in industry comments on the provision of bathing water for ducks. It concluded that a balance needs to be struck between the welfare needs of the birds and the risks to duck health, hygiene and food safety if ducks are given unlimited access to open water. DEFRA has funded two three-year research projects that assessed the welfare of ducks by means of a comprehensive assessment of different commercial systems currently in use in the country, as well as trying to ascertain the importance of bathing water to ducks by quantifying their motivation to gain access to water in which they can bathe. UK law still currently allows nipple drinkers.

The **British Poultry Council** Duck Assurance Scheme requires duck breeders to provide water facilities designed to allow ducks to cover their heads and take water into their beaks to shake over their body.

The **OIE** does not have a code for duck welfare.

The **Council of Europe** recommends that ducks are able to dip their heads in water and shake it over their feathers.

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