POULTRY WELFARE STANDARDS AND GUIDELINES – INDUCED MOULTING

SUPPORTING PAPER PUBLIC CONSULTATION VERSION

Prepared by the Poultry Standards and Guidelines Drafting Group, Oct 2016

ISSUES

- Identify acceptable methods for induced moulting of hens when it is deemed necessary.

RATIONALE

Induced moulting is a husbandry practice used to extend the period of lay of chickens. The practice is not used routinely but may be needed in exceptional circumstances, for example:

- to replenish flock numbers in the event of a disease outbreak;
- where there is a limitation on available grower space;
- where there is a shortage in the availability of day old pullets; or
- when there is a restriction on the importation of breeder stock due to exotic disease outbreaks overseas which necessitates the moulting of grandparent flocks.

Moulting is a normal process in birds. In their natural state, birds shed old plumage and grow new feathers in preparation for cold weather and migration. 'There are times when birds in the wild do not eat in spite of having food readily available, e.g. during moulting, breeding, and egg incubation' (Stevens, 1996, cited by Koelkebeck and Anderson, 2007). The environment for poultry housed for commercial egg production is constant with respect to temperature, lighting and feed, thus removing the normal seasonal influences.

Induced moulting rejuvenates the reproductive cycle of the hen, extending her productive life. All hens in a flock are brought into moult at the same time, which sustains more efficient egg production and improves egg quality.

Moulting results in the need to add 40-50% fewer hens per year than would be needed without induced moults (United Egg Producers, 2014). This, in turn, results in significantly fewer spent hens that are culled and also fewer male chicks that are killed. Induced moulting has an environmental benefit in that there is a reduction in the resources required and waste generated in growing more birds for egg production. Using moulted hens is also a key strategy for industry to respond to disease outbreaks such as avian influenza. Restocking sheds with moulted hens allows farms to return to production and economic viability faster than can be achieved through increased hatchings and replacement pullets.

RECOMMENDATIONS

The drafting group considered current scientific knowledge and practice and agreed that a standard was required to underpin poultry welfare for induced moulting.

ANIMAL HEALTH AND WELFARE CONSIDERATIONS

Traditionally, moulting has been induced by withdrawal of feed and/or water from the hens and reducing the photoperiod (day length) to that of a natural day length or less. The optimum age for moulting depends on the current flock's performance, local egg markets, and scheduling of the next pullet flock, but is usually around 65 weeks (Hy-line, 2016).

Fasting during moulting has a number of detrimental effects including a stress-induced increase in corticosteroids which can result in impaired immunity. In the United States, induced moulting of hens has been associated with an increased incidence of *Salmonella enteritidis*. Fasting also reduces skeletal strength and is associated with an increase in pecking behaviour, especially in the early stages of moulting (Patwardhan and King, 2010). Using dual-energy x-ray absorptiometry, Mazzuco and Hester (2005) showed that a nonfasted moulting regime is less deleterious to tibial bone mineral density and bone mineral content than a fasted moulting regime. Davis et al. (2000) found the physiological demands of peak egg production and moult (fasting) appeared to be similar as indicated by the levels of corticosterone and 3,5,3'-triiodothyronine (T3).

Water deprivation results in higher mortality and morbidity during the early stages of moulting (American Veterinary Medical Association, 2010).

Koelkebeck and Anderson (2007), studying post-moult production performance, found that non-feed withdrawal and fasting techniques were comparable. In these studies, genetic selection, strain, density, or moult program do not appear to adversely influence the behavioural patterns during the moult. The behavioural patterns displayed during a moult program include:

- energy conserving behaviours (resting)
- increase in pecking inedible objects (food-seeking)
- changes in aggressive behaviours – which may increase or decrease depending on the methods used to induce moult, and on layer strain
- post-moult increase in preening.

The behavioural patterns appeared consistent with the response to physiological changes that layers experience and did not appear to compromise the welfare status of the hens (Koelkebeck and Anderson, 2007) . They suggested that the use of alternative non-feed withdrawal moulting methods provide comparable laying hen well-being and may enhance the transition from a productive to a resting state.

Koelkebeck and Anderson (2007) noted the research of Webster (2000) and Anderson et al. (2004) suggesting that the behaviour changes associated with moulting appear to be predominantly adaptive changes, as would be expected as the hens progress through significant physiological changes moving into a non-productive period with limited feed and nutrient access. Webster (2000) also noted behaviour during the feed withdrawal period was consistent with conservation of bodily reserves, but feed withdrawal hens never lost their capability for alertness and reactivity.

Anderson and Havenstein (2007) studied the effects of alternative moulting programs on layer performance to 113 weeks of age. In a white-egg strain of laying hens, Anderson and Havenstein (2007) found both the nonfasted program and feed restriction moulted hens had 8% fewer mortalities over the total production cycle than the non-moulted hens. In the brown-egg strains they found a 7.8% reduction in mortality in the nonfasted program hens, and a 12% reduction in the feed restriction moulted hens compared with the 18.1% mortality in the non-moulted hens. Webster (2000) found that feed withdrawal hens had significantly lower mortality than control hens (2% vs

12%, respectively). Anderson (2002a in Koelkebeck and Anderson, 2007) found that, overall, the moulting of laying hens improved the livability of the flock by as much as 9% in some white egg strains. Moulting also resulted in improved reproductive efficiency and egg quality over the total production cycle compared with hens that had never been moulted (Koelkebeck and Anderson, 2007).

Anderson et al. (2004) found that aggression levels were no different between the first and second-cycle phases and that the feed-restricted moult group had lower levels of aggression than the birds fed a nutrient-restricted diet. Conversely, McCowan et al. (2006) found that birds which underwent induced moulting were more aggressive during the moulting period. Webster's (2000) research showed feed withdrawal hens exhibited an increased level of behavioural activation and attentiveness on the second day of feed withdrawal as indicated by increased standing and head movement. Non-nutritive pecking also was elevated on this day. Webster suggested that these behaviours may be interpreted as adaptive responses because, in the natural circumstances under which the chicken species would have originally acquired behavioural responses to food shortage, such responses would increase the likelihood of a chicken actually finding food.

Aggression has been shown to change as the hens progress through the different production phases, which could be interpreted as negative (Koelkebeck and Anderson, 2007). It has been shown that the number of aggressive acts declines significantly during a moult induced by fasting (Anderson et al., 2004; Biggs et al., 2004 in Koelkebeck and Anderson, 2007). However, alternative non-fasting methods have been shown to increase total aggression by 8 times over the hens that were not moulted; this corresponds with increases in submissive and avoid and escape behaviours (Anderson, 2002b; Biggs et al., 2004 in Koelkebeck and Anderson, 2007). Koelkebeck and Anderson (2007) suggested that during the moult the highest levels of aggression were actually in the non-fasted moult group who also had the highest heterophil:lymphocyte, indicating increased stress levels.

Webster (2000) indicated that there was no indication that hens experienced harm or debilitation when deprived of feed until a body weight loss of 35% occurred, nor was their behaviour suggestive of suffering. Webster suggests that it would be premature to conclude that the feed withdrawal hens did not suffer, but if they did, such a fact was not obvious from observation of the feed withdrawal behavioural repertoire. Webster's research showed that by the end of the period of feed deprivation, hens spent 40% of their time resting. While at rest, they would appear to be drawn in upon themselves and to have reduced attentiveness. Such hens sometimes are described colloquially as appearing depressed, however they were capable of vigorous activity during the entire feed withdrawal period (Webster, 2000).

Research has now shown that moulting can be successfully induced using non-feed withdrawal programs. Current practices include reduction of photoperiod (day length) and dietary restrictions (including diets of low nutrient density or specific mineral deficiencies including sodium or calcium) that result in cessation of egg production. Diets containing high concentrations of minerals such as zinc, aluminium or potassium or the administration of hormones have been trialled, but may have residual effects or unacceptable physiological alterations (Yousaf and Chaudhry, 2008; Bell and Kuney, 2004).

It is essential that factors such as flock health, bird weights and mortality rates are monitored during the moulting period (American Veterinary Medical Association, 2010). Hy-line International (2016) recommend the best post-moult egg production is achieved after a complete cessation of egg production that lasts for at least 2 weeks and a concomitant loss of body weight to the 18-week target weight (although, in the case of heavy birds, it is not recommended that the body weight loss exceed 24-25% of the pre-moult body weight for white laying hens and 21-22% for brown laying hens).

REVIEW OF NATIONAL POLICIES AND POSITIONS

Induced moulting is currently permitted in all Australian jurisdictions.

The current Australian **Model Code of Practice for Poultry** 4th edition (2001) states:

13 MANAGEMENT PRACTICES

9.5.1 Moult inducement or controlled feeding practices should be carried out only on healthy birds under close management supervision and under conditions that will not cause cold stress. Substitution of a high fibre diet, for example whole barley or oats is acceptable provided birds eat 40-60gm per day. Diets that the birds will not eat must not be used. Adequate feeding space is necessary during such practices.

9.5.3 Methods of moult inducement and controlled feeding which totally deprive birds of feed and water for more than 24 hours must not be used.

APPENDIX 5

Geese

A5.3.2 Moult inducement

The usual method is by manual plucking of breast feathers by a competent person.

The **RSPCA Australia** approved farming scheme standards for layer hens do not permit induced moulting whether by feed-withdrawal or non-feed withdrawal methods.

The **Australian Veterinary Association** has no published policy regarding induced moulting of poultry.

REVIEW OF INTERNATIONAL POLICIES AND POSITIONS

This section is included to provide a brief international context, while acknowledging that Australia's poultry production systems may vary from production systems, poultry breeds and climatic conditions in other countries.

The **American Veterinary Medical Association** states:

Induced molting of commercial layer chickens must be a carefully monitored and controlled procedure, with special attention paid to flock health, mortality, and bird weight. Neither water nor food should be withdrawn to induce molting. Acceptable practices include reduction of photoperiod (day length) and specific nutrient restrictions that result in cessation of egg production. Induced molting extends the productive life of commercial chicken flocks and results in a substantial reduction in the number of chickens needed to produce the nation's egg supply.

The use of forced moulting is rare in **Canada** and is not supported by the Canadian Veterinary Medical Association if birds are subjected to added stress.

While the **European Union** does not ban moulting per se, it effectively bans induced moulting by feed withdrawal under Council Directive 98/58/EC 14 which specifies:

Animals must be fed a wholesome diet which is appropriate to their age and species and which is fed to them in sufficient quantity to maintain them in good health and satisfy their nutritional needs.

The Directive also states:

All animals must have access to feed at intervals appropriate to their physiological needs.

The **United Kingdom** does not permit induced moulting by feed withdrawal.

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APPENDIX 1 – DEFINITIONS

Moult: the process whereby the bird sheds its feathers and ceases egg production. It is usually initiated by hormonal influences but is often triggered by stress.