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## *Literature Review on the Welfare Implications of Induced Molting of Layer Chickens*

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### THE ISSUE

Molting is a natural seasonal event in which birds substantially reduce their feed intake, cease egg production, and replace their plumage. Induced molting is a process that simulates natural molting events. When birds return to full feed, a new plumage develops and the birds resume egg production at a higher rate with better egg quality. Induced molting extends the productive life of commercial chicken flocks and results in substantial reduction in the number of chickens needed to produce the nation's egg supply. Induced molting also has a positive impact on the environment through reduction of waste and natural resources needed for growing more birds for egg production. However, molting induced by water deprivation or fasting causes discomfort and stress in hens.<sup>1</sup>

### WHAT IT IS

Molting in avian species is generally defined as the periodic shedding and replacement of feathers.<sup>2</sup> For most wild birds molting involves reproductive quiescence.<sup>2</sup> Domestic hens experience a reduction in reproductive function during a naturally occurring molt, but it has been found to be an incomplete reduction in function.<sup>2</sup> The hen often continues to lay eggs at a low rate for a prolonged period.<sup>2</sup> This is a period of unprofitably low egg production for the commercial egg producer that, in the past, would have signified the end of the useful life of the flock.<sup>2</sup> A decreasing price for eggs and meat products derived from spent flocks has generated interest in methods that allow flocks to be kept for more than one year.<sup>2</sup> Causing the onset of a molt to occur at a time other than that of a natural molt completely halts reproductive function and precipitates a loss of feathers.<sup>2</sup> A reduction in body fat and the regression of the female reproductive tract result in a significant loss of body weight.<sup>2</sup> Egg production resumes and increases rapidly to a profitable rate following an induced molt.<sup>2</sup> Traditional approaches to inducing a molt involved removing feed<sup>2</sup>, water<sup>2</sup>, or both<sup>2</sup> from the hens and reducing the photoperiod to that of natural day length or less.<sup>2</sup> Hens were fasted for a length of time sufficient to affect complete involution of the reproductive tract.<sup>2</sup> Recently, more research has been done to evaluate methods other than feed removal for inducing a molt and non-feed withdrawal methods are now in common use.

### WELFARE CONCERNS

The commercial induced molting procedure is generally carefully monitored and controlled. Current practices include reduction of photoperiod (day length) and dietary restrictions (including diets of low nutrient density) that result in cessation of egg production.

**Fasting**—Stress induced by fasting during molting programs leads to elevated concentrations of circulatory adrenal corticoids, which may cause an impaired immune response.<sup>3</sup> In addition, feed withdrawal during an induced molt is detrimental to the skeletal integrity of hens.<sup>4</sup> Research has shown that fasting is not necessary to induce a molt in laying hens.

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There are many effective non-fast methods that can be used to induce a molt including, but not limited to, feeding of low-sodium<sup>5</sup>, high-zinc<sup>5</sup>, high-corn<sup>5</sup>, high-wheat<sup>5</sup>, oral thyroxine<sup>6</sup>, ad libitum alfalfa<sup>7</sup> and low-calorie<sup>1</sup> diets. Also, molting induced by feeding a non-fasting diet of wheat middlings and corn has been shown to be less deleterious to bone mineralization as compared to a fast-induced molt.<sup>8</sup>

Behavioral patterns of hens in various molting programs have been examined by Dunkley et al. Nonnutritive pecking behavior is characteristically associated with hens undergoing feed withdrawal.<sup>9</sup> The researchers found that hens subjected to feed withdrawal displayed nearly twice as much nonnutritive pecking when compared to hens fed a diet of alfalfa combined with a layer ration or fully fed hens.<sup>9</sup> Another study revealed that hens subjected to a fast-induced molt exhibited more cage pecking during the molting stage than prior to molting and that hens undergoing both fast- and non-fast induced molts were more aggressive with other cage mates during the molting stage than during the premolt stage.<sup>1</sup> Results of vocalization studies further support that frustration is associated more with food deprivation than with low-calorie diets.<sup>1</sup> A higher gavel-calling rate and changes in vocal acoustic structure were observed in hens subjected to a fast-induced molt, but not in hens subjected to a nonfast-induced molt or that were not molted.<sup>1</sup>

**Water deprivation**—Water deprivation results in higher mortality and morbidity during the early stages of the molt cycle.<sup>5</sup> Water deprivation is not necessary to achieve a molt in poultry and is inhumane. Light conditioning prior to induction of a molt has been shown to eliminate the need to restrict water to effect cessation of lay.<sup>5</sup>

## SUMMARY

Special attention should be paid to flock health, mortality, and bird weight when molts are induced. The welfare of birds should be a major consideration in this and any management practice. The AVMA encourages ongoing research into the effect of various methods of inducing a molt on the well being and performance of laying chickens.

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