



March 1997 # 1

## WILD RADISH SEED CONTAMINATION OF LAYING HEN FEED

J. L. MacLean, D.M. Anderson, and T. Clarke

Some weed seeds in feedstuffs have the potential to cause reduced egg production or egg quality. Wild radish (*Raphanus raphanistrum*), which belongs to the mustard (*Brassica spp.*) family, is a common weed of grain crops in many parts of the Maritimes. The effects of contamination of grain with this seed on egg quality and egg production by layers have not been studied. Rapeseed meal (*Brassica spp.*), which also belongs to the mustard family, contains glucosinolates. The metabolites present after the hydrolysis of glucosinolates have antinutritional effects (Hulsman 1992). Reduced egg production and increased levels of mortality have been associated with high levels of rapeseed meal (Butler et al. 1982; Jackson 1969). Since egg yolk components are synthesized mostly in the hen's liver (Hurwitz 1987), it is possible that liver damage associated with high levels of glucosinolates may affect egg yolk quality. The glucosinolate content of wild radish seed is unknown.

To determine the level at which wild radish seed becomes a problem, late and early-cycle White Leghorn-type hens were fed a series of seven diets having wild radish seed contamination (0%, 0.001%, 0.01%, 0.1%, 1%, 5%, 10%). Egg production, feed consumption, and egg quality were

monitored for 1 week prior to the introduction of the contaminated feed, during the 2 weeks of feeding the contaminated feed and for 4 weeks after the removal of the contaminated feed. Egg quality was measured through specific gravity, egg weight, albumen height, Haugh units (HU) and yolk appearance. Yolk appearance was scored on a scale from 0 to 5, with 0 being a yolk of normal appearance and 5 being a yolk showing severe degradation.

### Results

For both late and early-cycle hens, egg production, egg weight, specific gravity, albumen height, and HU were not reduced by wild radish seed contamination. Storage of eggs resulted in significantly higher yolk scores for both late and early-cycle hens (Figures 1 and 2). For both the late and early-cycle hens, yolk scores tended to increase after one week of feeding the wild radish seed at all levels of contamination (Figures 3 and 4). For the late-cycle hens, after the second week of feeding the contaminated feed, yolk scores were significantly higher for eggs from the 0.001%, 0.1%, and 1% treatments compared to those from the 0% treatment. Although not significant, yolk scores for the early-cycle hens further increased after the second week



of feeding the wild radish seed. For both the late and early-cycle hens after the noncontaminated diet was resumed for 2 weeks, yolk scores decreased and yolk appearance improved.

### Industry Impact

The changes in yolk appearance caused by short-term contamination probably would not be particularly noticeable to consumers. Whereas this study looked at short term exposure, as would be the case with a contaminated residue from a bin of feed, a long term study would be beneficial to indicate effects of chronic exposure. If detrimental effects are found, producers might need to make a special effort to ensure their feed grains are free of wild radish.

### References

- Butler, E.J., et al. 1982.** *F. Sci. Food Agric.* 33:866-875.
- Hulsman, J. 1992.** *Proceedings World Poultry Congress, Amsterdam the Netherlands.* PP. 215-222.
- Hurwitz, S. 1987.** *In Wells, R.G. and Belyavon, C.G., eds. Egg Quality-Current Problems and Recent Advances.* C.G. Butterworth & Co. Ltd., England. PP 235-236.
- Jackson, N. 1969.** *J. Sci. Food Agric.* 20:734-740.

**Funding Source:** Nova Scotia Department of Agriculture and Marketing - AGRI FOCUS 2000.

### Researchers:

J. L. MacLean, Atlantic Poultry Research Institute.  
D.M. Anderson, and T. Clarke, Dept. Animal Science, Nova Scotia

Figure 1. Effect of Storage on Yolk Score of Eggs from Late-Cycle Hens

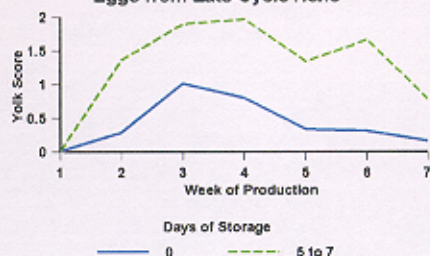


Figure 2. Effect of Storage on Yolk Score of Eggs from Early-Cycle Hens

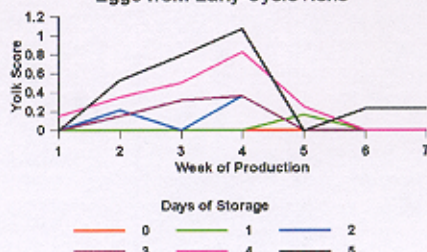


Figure 3. Effect of Level of Wild Radish Seed on Yolk Score of Eggs from Late-Cycle Hens

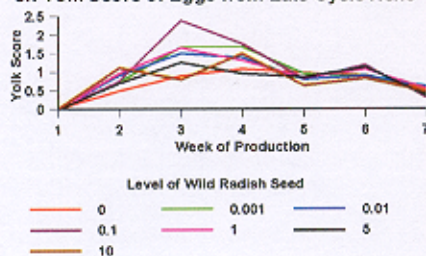


Figure 4. Effect of Level of Wild Radish Seed on Yolk Score of Eggs from Early-Cycle Hen

