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## *Calf Note #86 – Egg in milk replacers – an update*

*Introduction.* The use of egg, as spray-dried whole egg (**DWE**) or as some component (whites, yolks) have been evaluated for several years in calf milk replacers. Some researchers have been successful in making this source of alternative protein “work” – i.e., replacing milk protein, while others haven’t been successful. In [Calf Note #75](#), we looked at some recent research where we evaluated the use of 0, 10 or 20% SDWE in a conventional calf milk replacer (**CMR**) formula. In this Calf Note, we’ll look at some recent research that suggests that one or more components of egg may be involved in reduced performance.

A study by Dr. Dan Catherman (1) was presented at the 2002 ADSA/ASAS Annual meeting, held in Quebec City. In this study, 120 Holstein heifer calves (weighing an initial 36.7 kg) were fed a CMR containing no added egg (**CON**), 15% inedible SDWE, 9% edible egg albumin (**ALB**), 6% edible egg yolk (**YLK**) or 9% albumin + 6% yolk (**A+Y**). All CMR were formulated to contain 20% crude protein and 20% fat and were fed at the rate of 1 lb. (454 g) per day diluted into 3.8 L (1 gallon) of water until weaning at 35 days.

A commercial calf starter and water were offered beginning at day 3. The researchers measured intake of calf starter, milk replacer, body weight gain to 42 days. Calves were weighed at 0, 21 and 42 days and cost per kg of body weight gain was calculated. The researchers also calculated the number of veterinary treatments

Intake of CMR was constant at 13.8 kg for all calves during the trial. Intake of starter was lowest when calves were fed DWE or ALB – either alone or in combination with yolk (A+Y; see Figure). When calves were offered YLK (only egg derived from yolk), the intake of starter was similar to control.

Overall body weight gains were higher when calves were fed

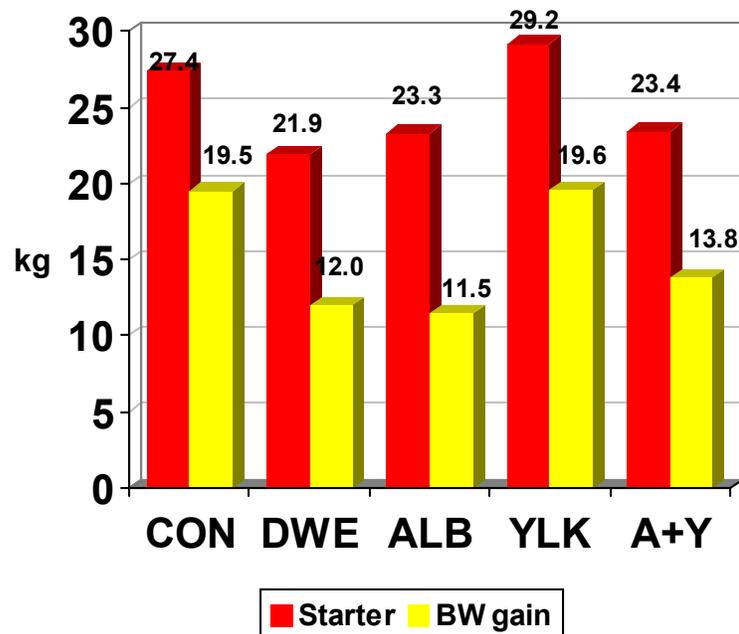


Figure. Intake of calf starter and body weight gain during the 42-day study by Catherman (1).

CON and YLK compared to all other treatments – a clear indication that inclusion of the albumin portion of the egg contributed to reduced performance.

It's particularly interesting that the albumin fraction reduced performance of calves in this study. The yolk fraction contains much of the fat that can be found in egg products – egg white (or albumin) is almost totally protein. The yolk fraction also contains significant IgY, the chicken form of IgG, which may provide some level of intestinal immunity. Some researchers have hypothesized that the fat in egg (which is found in the yolk fraction) might not be digestible to calves. However, the data presented here suggest that the cause of impaired performance is not poor digestibility of egg fat.

Catherman also calculated the feed cost per kg of gain. Cost for CON, DWE, ALB, YLK and A+Y were \$1.63, 2.27, 2.62, 1.67, and 2.24, respectively. Clearly, the cost of including products containing albumin (DWE, ALB and A+Y) were much higher than other costs. The researchers concluded that the inclusion of DWE – but especially the albumin fraction of egg –into CMR formulations resulted in reduced performance and an increase in cost per kg of body weight gain.

Egg yolk appears to be an acceptable ingredient for CMR. However, in many cases, yolks are sold to the human food industry, which makes them too expensive for calf milk replacers. However, when an opportunity to include yolks in milk replacers appears, these data would suggest that the yolk can be an acceptable ingredient.

## Reference

Catherman, D. R. 2002. Evaluation of dried whole egg and egg components in calf milk replacers. J. Dairy Sci. 85 (Suppl. 1): 307 (Abstr.).

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