

Carotenoids: key components in profitable egg production

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Every good business starts off by looking at the end market and by asking what customers really want. For egg producers there's really no doubt. Shell integrity is important, of course. But crucially it's all about the eating quality and attractiveness: freshness, taste and yolk colour.

And naturally, behind every high quality egg there has to be a healthy bird capable of producing cost-effectively and, in today's world, sustainably.

But let's start with the egg. DSM's consumer survey results indicate that 84% of respondents see the yolk colour as important. We also know that in most countries around the world a bright red-gold colour is preferred.

The important pigments involved are carotenoids, natural substances supplied by plants and fungi. These can be efficiently absorbed by hens and deposited in the egg yolk. Carotenoids have an antioxidant effect and this underlines their extra

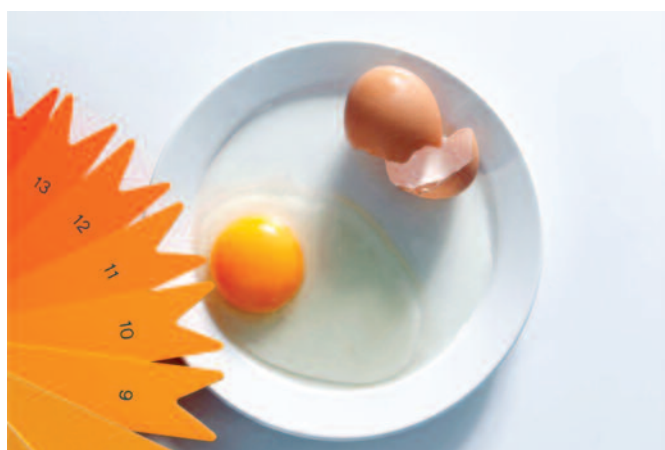
importance for the breeder egg, the growing embryo, hatchability and chick survival.

During rapid embryo development in the egg the metabolic action creates oxidation which damages cells and reduces embryo viability. Carotenoids combat this oxidation effect. In other words, they act as antioxidants. Present-day embryos and chicks develop fast. The resultant demand for antioxidant action calls for a higher level of carotenoid content than naturally available in feed crops. Carotenoid additives in poultry rations are the obvious answer.

This is a logical solution that actually occurred more than 60 years ago to our scientists. They pioneered the commercial synthesis of nature-identical carotenoids and introduced them into poultry diets.

Later research showed that these supplemental carotenoids are very efficiently absorbed by poultry, deposited in egg yolk and then in the liver and other tissues of the chicken embryo.

Continuing work by our scientists helped identify a carotenoid called canthaxanthin, one deposited



The DSM colour fan.

exceptionally efficiently in the egg yolk, ensuring extra good protection from oxidative challenge in the developing embryo.

Results repeatedly show that canthaxanthin, applied by DSM in its carotenoid additive Carophyll Red 10%, significantly improves yolk, embryo and day-old chick antioxidant status and increases both hatchability and chick numbers per hen housed. The resultant enriched yolk colour is nowadays accepted as a reliable indicator of antioxidant status with the laying bird. Because carotenoids are also important for disease resistance in adult birds, a weak yolk colour is also a warning that the carotenoids are being otherwise used for fending off disease.

Canthaxanthin efficiently provides a rich red colour. But yellow is also needed for the perfect yolk and here DSM offers Carophyll Yellow 10% containing the carotenoid apo-carotene-ester. Underlining the efficacy of these nature-identical DSM feed additives is the fact that just one teaspoonful of Carophyll in rations is all that's needed for precise adjustment of yolk colour in 8000 eggs.

But nowadays profitable and efficient production of a quality egg is not enough. With a background of shrinking global resources and climate change the valuable food we produce from our laying flocks has to be sustainable too. A good argument in this respect – one which

also helps the image of your eggs out in the marketplace – is that DSM carotenoids are nature-identical products. This means canthaxanthin and apo-carotene-ester are produced without using any cropland, leaving this free for conventional feeds and foods.

There was a time when nature-identical additives, even in the production of quality eggs and poultry, caused doubts amongst governments, retailers and consumers. Nowadays, though, the DSM policy of transparent and completely traceable production means its carotenoid additives are officially approved for use worldwide.

Retailers that formerly banned eggs produced with nature-identical additives in hen feed relented when offered a closer look into our production.

France is a good example of this egg retail revolution. Top of the food selling league there is France's largest supermarket chain, marketing 25% of all retail egg sales in the country. This supermarket chain allowed no eggs in the above category until DSM demonstrated the purity and failsafe traceability of its Carophyll products.

Now, top quality eggs produced with Carophyll Red 10% and Carophyll Yellow 10% are sold from these stores across the country – and consumers can depend on nutritious eggs with that special splash of colour in the yolk. ■

Fig. 1. Consumer preference of yolk colour in various countries (colour fan number).

