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P Smetana

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FEEDING FOR EGG YOLK COLOUR

By P. SMETANA, B.Sc. (Agric.), Adviser, Poultry Branch

On July 3, 1961, the Western Australian Egg Marketing Board commenced paying a bonus to producers for yolk colour. This is an extremely important step in the marketing of eggs and should have a widespread beneficial effect on the poultry industry of this State.

It is in the interests of all individual egg producers as well as the industry as a whole to ensure that eggs are produced with the desired golden coloured yolks. Farmers stand to gain directly from the bonus paid for eggs with a satisfactory yolk colour and indirectly from increased local sales and more favourable export markets which should stabilise egg prices. Increased local sales and improved export markets are confidently anticipated as the majority of consumers both at home and overseas have a definite preference for eggs which have rich golden coloured yolks.

Yolk colour is almost directly dependent on the nature of the ration fed to laying birds, therefore it is possible for every farmer to control the colour of the yolks. The pigment responsible for yolk colour in eggs is known as xanthophyll and a feedstuff rich in this pigment should be incorporated in the feed at the required level.

The choice of the ingredient used for supplementation in regard to yolk colour will be based largely on the economics involved. In this State the materials which should be considered are greenfeed,
lucerne meal, clover meal and possibly synthetic pigments.

**GREENFEED IN LAYING RATIONS**

Greenfeed is probably the most satisfactory feedstuff to incorporate into the feeding system for the production of golden coloured yolks. Fresh, good quality greenfeed supplied to laying birds at the rate of one to 1½ ounces a bird a day will be sufficient to produce an egg with the required yolk colour for bonus payment. This amount is roughly equivalent to one handful a bird or 6 to 9 lb. per 100 birds.

Several considerations are important in connection with the feeding of greenfeed. Firstly, only fresh, good quality material should be used. Old rank growth is much lower in nutritive value and will not have the same effect as young freshly cut material.

Suitable Plants:

There is a wide range of plants suitable as greenfeed but the most popular in this State are lucerne and more recently kikuyu grass in the form of a lawn. Although both these types of greenfeed are high in nutritive value, kikuyu has certain advantages which make it ideal for many poultry farms.

A well established area of kikuyu grass serves the dual purpose of beautifying the farm and providing birds with valuable greenfeed all the year round. Lawns should be frequently manured and watered to maintain a quickly growing sward. It is desirable to cut the lawn in strips and each section should be cut once a fortnight. The lawn should be cut with a heavy power mower close to the ground so that it does not become spongy. The clippings must be fed to the birds as soon as possible after cutting as there is a loss of nutrients on storage under ordinary conditions.

It has been found that enough greenfeed to provide for 2,000 layers can be cut with a 24-inch cut mower in about 12 minutes. The clippings thus obtained are in a form which is easily handled and palatable to poultry.

A quarter-acre plot of kikuyu is enough to supply greenfeed for 1,000 birds for most of the year. Perth soils are very suitable for the establishment of this grass.

Besides being extremely valuable in regard to egg yolk colour, greenfeed contains a number of nutrients including a wide range of vitamins. Vitamins known to be present in greenfeed are vitamin A in the form of the precursor carotene, riboflavin, thiamin, pantothenic acid, pyridoxine, biotin, choline, folic acid, vitamin K and vitamin E.

Much has been written about the tonic effect of greenfeed. Undeniably the addition of greenfeed to most relatively simple laying rations has a highly beneficial effect. Repeated experiments carried out at the Poultry Research Station in Wembley have shown that when greenfeed was incorporated into a variety of rations a general improvement in production results, particularly in diets not fully supplemented or on the borderline for efficiency.

It is evident that the inclusion of greenfeed not only improves the yolk colour of eggs but can also be responsible for a definite lift in production, depending upon the ration in use. Another interesting conclusion drawn from the results of experimental work at the research station is that when greenfeed is fed to laying birds from the time of housing in laying quarters, in almost every case there is a rapid and marked response in the first few months, which coincides with the autumn period when egg prices are normally highest. If the control ration (without greenfeed) is well supplemented and correctly balanced the greenfeed group may lose their early advantage but the benefit of favourable prices is still attained. Poorer rations without greenfeed may never make up the deficiency. This point is often overlooked.

Methods of Feeding:

The actual method of providing the greenfeed is important. Allowances should be made so that all birds have an opportunity of eating the required amount. In every flock sociological orders exist, which means that where feeding space is limited the late feeders may be unable to consume enough for optimum yolk colour, while the early feeders eat more than would be normally necessary. This factor could be responsible for some variation in yolk colour, which is undesirable.
Occasionally individual birds seem to have an aversion to greenfeed and will refuse to eat even small quantities. Fortunately these birds are rare and normally birds eagerly await the daily ration of greenfeed.

At present it is difficult to quote accurate figures for the costs involved in establishing and maintaining a greenfeed patch. Obviously there will be some variation from farm to farm, according to particular conditions prevailing at any one place, but in all cases some extra expense is incurred. With the introduction of the yolk colour bonus these costs will be more than covered. Farmers who have already established a successful source of greenfeed will stand to gain the full benefit of the premium.

In order to gain more information on the important factors of costs, maintenance and so on, connected with the establishment of a greenfeed source, investigations in these matters are now in progress and it is hoped that some cost estimates will be available in the future. Already one poultry farmer who is about to plant a kikuyu lawn has indicated a willingness to cooperate with the Department of Agriculture.

**ALTERNATIVES TO GREENFEED**

Despite the undeniable desirability for all farmers to develop an adequate source of greenfeed, there are cases where this is not possible. Circumstances such as a limited area of land, shortage of water and insufficient labour could mean that an alternative to greenfeed must be sought. One of these alternatives is to feed a ration containing quantities of dried lucerne meal.

**Lucerne Meal:**

Lucerne meal is a widely used ingredient in poultry laying rations. The problems connected with this feedstuff in Western Australia are the relatively high cost and range in quality. Local sources are insufficient to meet demands, which necessitates importation from the Eastern States and a consequent high price. Also the locally produced product tends to show considerable variation in quality from the different sources. Attention to the methods of drying the product would help to overcome this range in analysis. The most satisfactory type of meal is one which has been dehydrated rather than sun cured.

Trials with various levels of lucerne meal in rations tested at the research station have shown that 7 per cent. meal in a diet provides the eggs with a fairly pleasing golden coloured yolk. In these experiments a good quality meal was always used and more recent work by various organisations seems to indicate that a higher level is necessary to ensure satisfactory yolk colour.
To allow for variations in quality it is recommended that a level of 10 per cent. of lucerne meal should be fed in layers' rations. This will probably be the level accepted by feed manufacturers.

Farmers using prepared rations will not be unduly concerned in this matter apart from ensuring that the feed purchased guarantees the recommended level. Where rations are mixed on the farm then quantities of good quality lucerne meal should be included at the rate of 10 per cent. of the mixture.

Higher levels will not normally be required and are not recommended on account of the cost factor and high fibre content. Where limited amounts only of greenfeed are available then lucerne meal may be used at reduced levels to augment the xanthophyll content of the ration. The most practical procedure is to try certain combinations and observe the resulting yolk colour, remembering that an interval of up to three weeks from time of feeding is required before the colour becomes stable.

Lucerne meal is also high in nutritive value. Soil, weather, climate, age, temperature, method of processing and storage all have an effect on quality, and it is difficult to give analysis figures, but a typical sample would contain about 16 per cent. protein and 25 per cent. fibre. In addition lucerne meal contains nearly all the vitamins and minerals required by poultry. It is particularly high in carotene, riboflavin, vitamin K, vitamin E and pantothenic acid.

Clover Meal:

The addition of lucerne meal to some rations will increase the cost of the feed, especially where the meal is not locally produced. In order to overcome this extra cost, trials were carried out to determine the suitability of locally produced clover meal as a substitute for expensive lucerne meal.

It was found that clover meal was satisfactory from a nutritional point of view and also that high levels imparted a golden colour to the yolks. As with lucerne meal, there is a wide range in the quality of clover meal. The analysis of clover meal will show variation according to variety, stage of maturity at time of mowing, conditions of drying and the method of handling. Normal samples have about 10 per cent. crude protein and 20 per cent. fibre.

Clover meal is lower in xanthophyll than lucerne meal and therefore higher levels are required for satisfactory yolk colour. Trials at the research station showed that a level of up to 5 per cent. was required before any marked colour change was detected in the yolk. At eight per cent. the yolks exhibited a fairly satisfactory colour but once again only high quality material was used. Because of the great variability of samples of clover meal it is recommended that levels in excess of 10 per cent. but not exceeding 15 per cent. be used. A feed with 12 per cent. clover meal should be suitable.

Synthetic Pigments:

Not much can be said about the use of synthetic pigments for egg yolk colour at this stage. Work is in progress at the poultry research station on this subject and information will be published when it becomes available.

Although the importance of good yolk colour had been stressed for many years, a check on a cross section of eggs received by the Egg Board in 1959 showed that less than half had brightly coloured yolks. With the incentive of a bonus for yolk colour, it is hoped that farmers will realise and make use of the benefits to be derived from the production of golden coloured yolks.

SUMMARY

To qualify for the yolk colour bonus, feed:

- Fresh, high quality greenfeed at 1½ ozs. a bird a day;
- Lucerne meal, at the rate of 10 per cent. of the laying ration;
- Clover meal, at from 10 to 15 per cent. of the ration, depending on quality of the meal.
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