

Energy levels in laying hen feed: Effect on performance and behaviour

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Effect of the energy level

Between 2200 and 3000 kcal, for an energy level reduction of 100 kcal, the energy consumption drops by an average of 1.2 % when the effect of diluting the feed is studied and by 1.4% when the reduction in fat levels is studied. These results agree with those obtained by T.R. Morris in a study performed in 1968. The energy level of the feed has little effect on the number of eggs produced and in all cases the differences are less than 1%. The egg weight reduces in accordance with the reduction in the feed energy level. The reduction can be estimated at about 0.5% for a variation of 100 kcal. The consumption rate, expressed in kcal per gram of egg produced, always improves with the dilution of the feed. The gain is about 0.8% for 100 kcal. This rate gain is a result of a reduction in body weight, an improvement in feather cover and an improvement in the digestibility of the feed. In many experiments the addition of fats seems to have a specific effect on energy consumption due to an improvement in palatability and the physical form of the feed. When the feed is diluted, the reduction in consumption is particularly marked at the time of the change. Laying hens take several weeks to increase their level of consumption gradually.

Energy regulation depends on the dilution methods used. The feed density (gm per litre) seems to be the limiting factor in ingestion regulation. The presence of insoluble fibre appears to be essential. It increases gizzard size, improves starch digestibility and limits feather pecking by reducing the need to ingest feathers.

Conversely, the addition of fats brings about an improvement in feed palatability and thus an increase in energy ingestion in proportions which can be very significant. Increase in egg weight is only one result of this. These effects are dependent upon the quantity and type of fats added.

From a practical point of view, the effect of low density, high cellulose (insoluble fibre) raw materials may be balanced by the use of fats. The feed presentation also has an effect on energy consumption. If the feed is too fine this will cause a reduction in energy consumption.

It thus appears that the 3 following factors must be controlled: the physical form of the feed, the cellulose content and the oil content. A balance between these 3 criteria must be sought in order to make possible the expression of genetic potential at a lower cost.

Effect on viability

Feed dilution forces hens to increase the volume and quantity of feed ingested and, therefore, to increase the feed consumption time. There is no longer any doubt that feed dilution brings about an improvement in plumage and a reduction in feather pecking itself. This explains the mortality reduction observed in certain trials using diluted diets.

Comparison between feed in meal or pellet form shows that the consumption times are lower when the feed is in pellet or crumb form. This explains why feed in pellet form causes deterioration in plumage and increases feather pecking.

Even though most researchers are in agreement over establishing a relationship between consumption time and feather pecking, recent studies show a specific requirement for insoluble fibre. Indeed, it appears that there is a specific requirement for insoluble fibre. The absence of insoluble fibres in the feed is responsible for the consumption of feathers and their presence in the gizzard, even when hens are housed in individual cages. Some studies make it possible to conclude that insoluble fibres do have an effect on the quality of plumage and on mortality. The specific size of the fibres would seem to be important.

We have noted that countries using sunflower meal in quite significant quantities display lower mortalities than those countries that do not use it, whether using cages or floor systems. Positive effects were observed after the introduction of sunflower meal to feed for free-range hens.

For floor or cage systems of production, it is, therefore, advisable to avoid energy levels that are too high and to incorporate a minimum of cellulose. It is essential to have a minimum depth of litter in the house/pen?