

## RESTRICTED FEEDING OF LAYING STRAIN PULLETS

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Summary

Factors modifying the responses of laying-strain pullets to restricted feeding are discussed. The influences of diet, lighting pattern and duration of restriction appear to be of major consideration on subsequent rate of lay and peak lay.

## I. INTRODUCTION

Although a considerable amount of experimental work, on overseas and Australian stock has been published on this topic, a good deal of confusion appears to exist in the minds of producers and servicemen on the real value of this technique. In fact one could say that over the last 2 to 3 years the practice has lost a deal of credence and application.

The reasons for this lack of application are varied and the following factors are probably involved. Firstly, the physiological explanation for the better performance of restricted-fed pullets is not yet known. Therefore the techniques used have been empirically applied and no scientific parameters have been established to guide the pullet grower. There are at present a large variety of nutritional manipulations used to restrict-feed growing pullets: the feeding of low protein diets, amino acid imbalanced diets, various techniques of limiting feed intake, as well as combinations of these methods. All are termed restricted feeding yet result in a varied end-product.

Further the time to commence restriction, the degree of restriction the length of time on restriction and whether to phase into full feed or return to full feed abruptly at the end of restriction are ill-defined.

A further factor is the size of the egg-type layer. These vary from the small Leghorn strain crosses to the heavier White Leghorn-Black Australorp crosses. The latter breeds have been reduced in size over the past ten years, but are still larger than the Leghorn-strain crosses. Do these different strains have different degrees of restriction to optimise egg production? The methods for restrict-feeding of pullets recommended by the various Australian breeding organisations are frequently confusing and, to my mind, do not restrict severely enough. All these factors have tended to confuse the objectives and application of restricted feeding in the field.

Until such time as the physiological explanations for the benefits of restricted feeding are forthcoming the application of the technique will remain empirical. However the bodyweight of pullets is the most important parameter to measure when restrict-feeding. After all, this is the final and irrefutable evidence of the feed consumed by the growing pullet. There is no substitute for this measure and it is not difficult to obtain. Without this measure it is extremely difficult for farmers to determine how effectively their rearing programme is developing. In addition comparisons between experimental work is often

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impossible without body weights.

## II. RESPONSE TO RESTRICTED FEEDING

There are three areas which I feel are important as they may well affect the response of restricted-fed pullets. These are firstly the rations fed to pullets as they come into lay, secondly the lighting patterns applied during rearing and particularly at the time of the commencement of lay, and thirdly the duration of restriction.

### (i) Laying diets

Bornstein, at this meeting in 1977, drew attention to the problems of both energy and protein intake of pullets commencing egg production. He demonstrated that pullets and especially breeds with lower body-weights, could underconsume both energy and protein at this period. When this occurred the young pullet ceased laying in order to restore her body reserves and thus ultimate peaks of production were not achieved. And there appears to be a general consensus, although I have not found any published work specifically on this topic, that the higher the peak or level achieved at the onset of production the higher the total egg production.

Restricted-fed pullets consume more than their full-fed sisters when restriction is lifted. Thus Bornstein's work may partly explain the higher peaks frequently observed in restricted-fed pullets.

However the protein levels of commercial laying diets have been pruned over the last few years, particularly following the marked increases in price of protein meals. In addition the energy contents of some commercial laying diets have tended to remain on the 'low side. Thus pullets commencing production may conceivably be consuming insufficiently concentrated diets at the onset of lay. Pullets commencing production during the very hot months in Australia (November to February) could be particularly disadvantaged on such diets.

Restricted-fed pullets usually peak higher than their full-fed sisters and gain comparatively more body weight immediately after the onset of production. Thus the restricted-fed pullet could conceivably have a particularly high demand for concentrated diets at this time and I suggest this is an area which requires attention.

### (ii) Lighting patterns

The second factor is that of the lighting pattern to which growing pullets are exposed during growing and as they commence production. In my experience most complaints about poor performance of layers involve birds commencing production during the late summer to mid-winter period.

Many pullet growers do not have lights in their rearing sheds. Others place the growing birds on a constant 15 hour-day length but the light pattern is only applied at one end of the day. Unless carefully monitored, alterations in day length may well be experienced by pullets, especially about the equinox.

The effects of restricted feeding and decreasing light patterns

are essentially additive in delaying sexual maturity. Thus pullets restricted-fed and under decreasing lighting patterns may be very severely restricted and not come into worthwhile production until 30 weeks of age, or later. These pullets, when feed restriction is lifted, will overconsume yet not burst into production. Instead they will lay down fat for a few weeks and this will largely negate any benefits from feed restriction during rearing.

Conversely, pullets restricted-fed and maturing under increasing day-length patterns tend to burst into production when placed on full feed. Such flocks peak well and never look back. However, as mentioned earlier, the longest daylengths in Australia are frequently combined with markedly increased ambient temperatures.

I therefore suggest that restricted-fed pullets be placed on an increasing light pattern 3 to 4 weeks before restriction is lifted, Further they should be kept on an increasing daylength pattern for at least four weeks after restriction is lifted.

### (iii) Duration of restriction

I feel that the age at which restriction is lifted is very important and have some data to support this observation, The chronological and physiological age of the pullet is of great importance. She must be old enough to immediately commence egg production when placed on full feed. Limited published work suggests that the WL X BA pullet should be at least 22 weeks of age before lifting restriction. It is interesting that the recommendation for the Shaver White Leghorn strain cross is to restrict to 22 weeks of age as well.

In the field today restricted-fed pullets are frequently sold and moved into laying cages at 18 to 20 weeks of age. These birds are then placed on full feed and over-consume for several weeks before commencing production. I therefore suggest that crossbred pullets should be given restricted amounts of feed to at least 22 weeks of age before being placed on full feed.

### III. CONCLUSIONS

I feel that far more attention should be paid to the management and feeding from 18 to 30 weeks of age of restricted-fed pullets. such pullets should be placed on an increasing day-length pattern from 3 to 4 weeks before being placed on full feed. They should be restricted to at least 22 weeks of age. Finally they should be fed a high protein, high energy diet for the six weeks after being placed on full feed. These techniques hopefully will enable restricted-fed pullets to peak properly and respond to the restriction as expected.

The results of a number of laying trials conducted at Laureldale Rural Research Station will be presented and discussed.