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Purdue 58 Lamb Pellet

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In 1958, Purdue University developed a complete pellet for self-feeding lambs (Perry, Beeson and Harper, 1958). This was probably the first real "breakthrough" in lamb feeding and even today this pellet is producing phenomenal results in many phases of sheep and lamb feeding.

This pellet has been named the "58" pellet for the year in which it was developed. The original composition is given in Table 1.

Table 1. Composition of original "58" pellet

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>lb./100 lb.</th>
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</thead>
<tbody>
<tr>
<td>Ground corn cobs</td>
<td>39.5</td>
</tr>
<tr>
<td>Dehy. alfalfa meal (17%)</td>
<td>20.0</td>
</tr>
<tr>
<td>Ground yellow corn</td>
<td>32.0</td>
</tr>
<tr>
<td>Soybean oil meal</td>
<td>7.0</td>
</tr>
<tr>
<td>Iodized salt and cobalt a/</td>
<td>0.5</td>
</tr>
<tr>
<td>Steamed bonemeal</td>
<td>1.0</td>
</tr>
<tr>
<td>Vitamin A and D b/</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td>100.075</td>
</tr>
</tbody>
</table>

a/ Cobalt added to the iodized salt at the rate of 1 oz. of cobalt carbonate/100 lb. salt
b/ Vitamin A and D concentrate originally gave 1700 units of vitamin A and 212 units of vitamin D per pound of ration

In recent mixtures, the vitamin concentrate has been strengthened to give 2000 units of vitamin A/lb. of ration and trace mineralized salt is used to supply the cobalt.

The original pellet was developed primarily for use with feeder lambs and was believed by the original authors to have the following advantages: (1) permits self-feeding (2) eliminates hazards of bringing lambs to a full feed since lambs are on full feed the first day (3) results in increased gains (4) well adapted to automation (5) eliminates sorting of feeds and nutrients (6) permits the simultaneous feeding of a balanced ration (7) allows proper ratio of grain to roughage ration (8) cuts down or eliminates digestive disorders and over-eating disease.

Considerable research has been done at Purdue on the modifications of the 58 pellet. At the time the pellet was developed Perry, Beeson and Harper (1958) tested the following modifications: (1) 7.5 per cent yellow grease, (2) 10 per cent cane sugar, (3) 10 per cent cane sugar plus 7.5 per cent yellow grease, (4) replacing soybean meal with an equivalent amount of protein from dried skim milk, and (5) replacing soybean meal with an equivalent amount of protein from 60 per cent Menhaden fish meal. None of the above ingredients tested improved the performance of the lambs over the original formula either in rate of gain or efficiency of feed utilization.

In 1959 a ratio of 60 per cent roughage and 40 per cent concentrate was compared to a ratio of 40 per cent roughage and 60 per cent concentrate (Perry, et al., 1959). Feeder lambs averaging 75 pounds on the high roughage pellet gained 14 per cent more rapidly than those on the low roughage pellet. The high roughage ratio is similar to that in the original formula which contains

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39.5 per cent ground corn cobs and 20 per cent dehydrated alfalfa meal. In the same experiment, different sources of roughage were compared in both the high and low roughage rations. Roughages used were: ground corn cobs, oat mill feed, soybean mill feed, sun-cured alfalfa, sugar cane bagasse and cottonseed hulls. The level of dehydrated alfalfa meal remained at 20 per cent. Sugar cane bagasse or cottonseed hulls did not affect rates of gain significantly in either ratio of roughage to concentrate. Oat mill feed depressed the gain on both the low and high roughage rations and the lambs required more feed per pound of gain when compared to corn cobs. This roughage was the most poorly utilized of all those tested. On the high concentrate ration, the lambs receiving most of their roughage from soybean mill feed or sun-cured alfalfa gained significantly less than lambs on the corn cob control ration. From these tests it was concluded that ground corn cobs were utilized better than any of the other roughages tested and the original formula was not improved by any of the modifications.

In 1964, the level of ground corn cobs was lowered and the level of ground yellow corn was increased proportionally (Smith and McDonald, 1964a). Three rations were compared: Lot 1 - 39.5 per cent cobs and 32 per cent ground corn (the original formula), Lot 2 - 20 per cent cobs and 51.5 per cent corn, and Lot 3 - 0 per cent cobs and 71.5 per cent corn. The other ingredients in the original formula remained the same. The average daily gain was as follows: Lot 1 - 0.51 pounds, Lot 2 - 0.48 pounds, Lot 3 - 0.37 pounds. The feed required per pound of gain was 7.76, 7.48 and 6.54 pounds and the feed cost per pound of gain was 20.1 cents, 21.3 cents and 20.3 cents, respectively. The authors concluded that growth was significantly depressed when all the corn cobs were removed from the ration; however, the performance of the lambs fed either 40 or 20 per cent ground corn cobs was very good, with a small difference between the two lots. The feed required per pound of gain decreased as the level of cobs decreased, with the greatest effect between 20 and 0 per cent, but the cost per pound of gain was essentially the same since the cost of the ration increased as the level of cobs decreased. The greatest advantage of the high level of cobs occurred during the first two weeks of the experiment. One lamb died of enterotoxemia during the first week in the lot with no cobs.

In 1965, two trials were conducted to study the effect of various levels of dehydrated alfalfa meal and various levels of urea, in a pelleted lamb ration (Perry, et al., 1965). In the first trial, 65 native lambs averaging 44 pounds each were divided into four lots and fed for 71 days. Lot 1 received 60 per cent ground corn cobs, no dehydrated alfalfa meal and 3.4 per cent urea as a source of protein. Lot 2 received 40 per cent ground corn cobs, 20 per cent dehydrated alfalfa meal and 2 per cent urea. Lot 3 received 20 per cent ground corn cobs, 40 per cent dehydrated alfalfa meal and 0.7 per cent urea. Lot 4 received no ground corn cobs, 60 per cent dehydrated alfalfa meal and no urea. Ground yellow corn and 10 per cent molasses served as a source of energy. The addition of 20 per cent dehydrated alfalfa meal resulted in a slight increase in gain over the lot that received no alfalfa meal but the cost of gain was increased. There appeared to be no advantage in adding more than 20 per cent alfalfa meal to rations in which urea served as a source of protein. Lambs receiving high levels of alfalfa meal tend to exhibit excessive urination and loose droppings.

In the second trial, 53 lambs averaging 76 pounds were fed three rations for a 22 day period. Lot 1 received the Purdue 58 pellet, Lot 2 received 2 per cent urea and 20 percent dehydrated alfalfa meal and Lot 3 received 0.7 per cent urea and 40 per cent dehydrated alfalfa meal. No soybean meal was fed in Lots 2 and 3. Neither of these rations improved on the performance of the
Purdue 58 pellet, but Lot 2 produced similar results. Both trials indicated that urea can be used to supply a high proportion of the total protein under proper price relationships.

In 1964 a group of lambs were fed the Purdue 58 ingredients in meal form as compared to the pellet (Smith and McDonald, 1964). The average daily gains on the meal decreased nearly 50 per cent from 0.42 pounds to 0.20 pounds and the daily intake of feed decreased 25 per cent from 4.1 to 3.1 pounds. The feed required per pound of gain increased from 9.8 to 16.0 pounds on the meal. When meal is used the lambs tend to sort out the ingredients and do not obtain a balanced ration. For best results, a 1/4 inch or a 3/8 inch pellet should be used.

The above described research indicates that within certain limits, modifications can be made in the original formula of the Purdue 58 lamb pellet. In most cases however, no significant improvement in the gains, feed required per pound of gain or feed costs have been obtained in the finishing of lambs through these modifications.

One of the problems in preparing the 58 pellet is a continual source of ground corn cobs. The use of picker-shellers has reduced the supply of cobs and the demand upon corn cobs for bedding and other uses creates competition for feeding use. Another problem is that the abrasive properties of the cobs may damage pelleting equipment and some feed mills do not like to prepare the pellet. In such cases or in areas where corn cobs are not available, poor quality hays with a high fiber content can substitute for the cobs. The use of excessive amounts of dehydrated alfalfa meal or even good quality alfalfa hay is not recommended since costs will be increased and the lambs may develop loose droppings and exhibit excessive urination.

As a source of energy, molasses may be used to replace from 5 to 10 per cent of the ground corn, when the proper price relationship exists. It increases palatability, reduces dust in the mixing process and serves as a binder for the pellet.

Gains normally expected with feeder lambs receiving the 58 pellet are about one-half pound per day. These can be increased to three-fourths pound per day with implants of 3 milligrams of diethylstilbestrol. Some lamb feeders prefer to use the 58 pellet as a starter pellet to get lambs on feed, since it is safe and can be self-fed. After about 2 weeks, they gradually shift the lambs to a heavier concentration of shelled corn. Under these conditions, it will be necessary to vaccinate the lambs against enterotoxemia at least 14 days before the shift to a more concentrated ration is made. Such vaccination has not been considered necessary when the 58 pellet is used throughout the feeding period.

Since 1958, this pellet has been used for many kinds of sheep feeding, including the growing of breeding lambs, the wintering of pregnant and non-pregnant ewes, the fitting of show sheep and even the finishing of steers. No research has been conducted at Purdue to determine its value for these purposes, but satisfactory reports have been received from those who have used it as such with some modifications.

Through the years, the Purdue 58 pellet has served the sheep industry in many ways. Much of its success can be attributed to the balance of nutrients which it contains. It is also relatively cheap, easy to handle and store and almost foolproof for the inexperienced sheep feeder.
References


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