

# Safflower Meal Digestion Tests

lambs used in digestion trials with decorticated seed meal to test product as feed for livestock

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**Safflower oil-cake meal**—a high-protein meal that is a promising source of protein for laying hens—was tested as a possible livestock feed in digestion trials with wether lambs.

In 1953, the safflower acreage in California had increased—from less than 100 experimental acres in 1948-49—to 45,000 with a seed yield of about 28,000 tons.

Safflower oil is one of the oils of commerce, available in large quantities on a year-round basis. It is a semidrying oil, used industrially as a raw material for production of protective coverings, ink vehicles, putty, and linoleums.

The oil-cake meal resulting from pressing the oil from the seed is being offered as a feed for livestock under the name whole pressed safflower seed meal. Machines are able to remove most of the hull from the seed before the oil is expressed. The oil-cake meal obtained from this process of decortication may have twice the percentage of protein and one half as much fiber as the whole pressed seed, though processing to remove the

All vaccines are not manufactured from the same strain of infectious bronchitis virus. Some manufacturers suggest that their products are safe to use on laying birds, and other manufacturers emphasize that their product may have an adverse effect on egg production. There has not been time to test the products beyond their effect on growing chickens. No tests have been conducted with laying hens.

Tests of the new vaccines conducted in the laboratories of the School of Veterinary Medicine are concerned with one thing—the protection of the California poultry industry—and until further tests can be made, they have been concerned thus far with the type of reaction and mortality which can be expected when the vaccine is applied to growing chickens, and the nature of the virus used in the vaccine.

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**Chemical Composition of Safflower Products.**  
(Average)

	Moisture %	Crude protein %	Ether extract %	Crude fiber %	Ash %	N.F.E. %
<b>Decorticated meal</b> . . . . .	8.0	36.0	7.6	17.5	7.4	23.5
<b>Whole pressed seed</b> . . . . .	8.0	19.0	6.0	33.0	4.0	30.0
<b>Hulls</b> . . . . .	8.7	3.8	4.7	53.1	1.4	28.3

hull adds considerably to the cost. The hull removed is about one half crude fiber, but oil from unseparated seeds may still amount to 4% to 5%. The hull has less ash than the whole pressed seed.

The average chemical compositions of decorticated meal, whole pressed seed, and hulls are given in the two-column table on this page.

The digestion trial at Davis was made with decorticated safflower meal of 36% protein content, as shown in the table. The meal was made of about equal proportions of two varieties—N6 and N852—of seed from the 1952 harvest. The seeds were decorticated before pressing, with the result that the crude fiber content was reduced to 17.5%.

Four wether lambs were tested on levels of 0%, 25%, 50%, and 75% of the safflower meal added to the basal ration of ground alfalfa hay with 20% molasses. The molasses was added to increase palatability to insure daily cleanup of rations. Each animal was fed for a preliminary period of one week on each of the four rations. Coefficients of digestibility were calculated from the results of these sixteen trials. The results are summarized in the following table.

**Average Coefficients of Digestibility**  
**Decorticated Safflower Meal.**

<b>Crude protein</b> . . . . .	<b>88</b>
<b>Ether extract</b> . . . . .	<b>89</b>
<b>Crude fiber</b> . . . . .	<b>23</b>
<b>Nitrogen free extract</b> . . . . .	<b>63</b>
<b>Total digestible protein</b> . . . . .	<b>32%</b>
<b>Total digestible nutrients</b> . . . . .	<b>66%</b>

Earlier, a similar digestion trial was run on a sample of whole pressed safflower seed. Unfortunately, it was learned after the trial was completed that the sample was faulty—the oil had apparently oxidized or polymerized. This lowered the coefficients of digestibility of most of the constituents, so that the

total digestible nutrients—T.D.N.—were only 36%. However, the digestibility of the crude fiber was 26%. No other sample of whole pressed seed in which the oil content was impaired has been encountered.

If the average coefficients obtained with the decorticated meal are applied to the composition of whole pressed seed, the figure for total digestible protein should be 16% and that for T.D.N. approximately 54%.

Further digestion trials are under way with sheep on a ration containing 50% of the high fiber hulls, listed in the larger table, mixed with a basal feed of alfalfa hay, barley and molasses. Information from these trials will be used to help interpret feeding trials with steers which have been carried out in the Sutter Basin.

A duplicate trial is also underway on a market grade whole pressed seed of 19% protein content.

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paired fruit production or damage—will be attempted when facilities for controlled fluorine fumigation experiments are completed. Thus far, there is no field evidence of leaf scorch or burn in citrus attributable to fluoride.

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