

# Earth Materials

## growth trials show no benefit to chicks on practical starting ration

F. H. Kratzer and C. R. Grau

**Results of growth trials** with young chicks indicate no justification for the use of natural earth materials in rations for those chicks fed a practical starting ration.

Natural earth materials increase the cost of the ration considerably and are of no benefit to the birds.

The established mineral requirements of poultry for calcium, phosphorus, manganese, sodium, and iodine must be given special consideration in formulating rations, but several other elements needed are supplied adequately by the usual poultry feedstuffs.

Mineral supplements, which supply one or more of the needed elements, have

a valuable place in formulating adequate rations. There are, however, several natural earth materials available to feed manufacturers and poultrymen that are poor sources of the elements which are known to be needed in poultry rations. On the other hand, fluorine is present in only small amounts and far below a level which would be considered toxic.

To determine whether several of the natural earth materials available to feed manufacturers and poultrymen have any value for a growing chick, two growth experiments were conducted with chicks in batteries. In the first trial, two products were tested by adding each at a 2½% level to a practical starting ration.

**Analysis of Natural Earth Materials (%)\***

	Calcium	Phosphorus	Manganese	Sodium chloride	Iodine	Acid insoluble ash	Fluorine
Range . . .	1.5-3.9	0.03-0.23	0.008-0.025	0.0-0.3	0.0007	52-92	.002-.018
Rep. value	2.5	0.1	0.015	0.1	0.001	73	0.01

\* Data supplied by Feed Control Laboratory, Bureau of Field Crops, California Department of Agriculture, Sacramento.

# Infectious Bronchitis

## vaccines released for growing birds not yet tested for laying hens

R. A. Bankowski and D. E. Stover

**Infectious bronchitis** is widely distributed in the major poultry raising areas in California. However, all respiratory diseases of poultry are not caused by infectious bronchitis virus. Vaccination with a live virus vaccine against an impending respiratory disease should not be attempted until the respiratory condition for which the vaccine is intended has been correctly diagnosed by a qualified veterinarian or laboratory.

Vaccines for infectious bronchitis consist of live—though modified—virus. Selected strains of the virus have been weakened, by one means or another, to produce a modified form of the disease but are intended to retain their immunity-producing qualities.

Release of commercial vaccines by the Division of Animal Industry of the California Department of Agriculture—the responsible authority for releasing these products—does not mean endorsement of either the effectiveness of the vaccines against infectious bronchitis or of the duration of the immunity they may produce.

Granting of authority to use such vaccines in the state means only that samples tested—by the University of California School of Veterinary Medicine—will not cause excessive mortality or serious reactions in growing chickens. It cannot be determined yet—nor perhaps for several years—how effective a vaccine may be or how one compares with another. These

The rations were fed to newly hatched Single Comb White Leghorn chicks of mixed sexes for a four-week period. Gains of the chicks fed the supplemented rations were very similar to those of the control chicks, as shown by the following table.

**Effect of Natural Earth Materials Upon the Growth of Chicks.**

Ex-periment I	Level %	No. per group	Average cumulative gain (grams)				
			1	2	4	6	8
<b>Control . . .</b>							
		25	23	63	195		
<b>Supplement No. 1</b>							
	2½	25	27	60	197		
<b>Supplement No. 2</b>							
	2½	25	22	58	180		
<b>Ex-periment II</b>							
<b>Control . . .</b>							
		9	66	159	376	664	1016
<b>Supplement 2½</b>							
	2½	10	55	138	361	663	998

In the second experiment, Single Comb White Leghorn cockerel chicks approximately 10 days old were used. Chicks fed 2½% of the natural earth material failed to make as rapid growth for the first two weeks of the trial, but at the end of eight weeks, there was little difference between the supplemented and the control groups.

The trials showed that natural earth materials did not improve the growth of young chicks.

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problems will require extensive laboratory and field observations.

Representative samples of vaccines—submitted by the manufacturers which pass the tests—are no guarantee that all additional lots of infectious bronchitis vaccine shipped into California in the future will be equally safe to use.

Poultrymen must study carefully the recommendations set down by the manufacturers of these new vaccines. The difference between manufacturers' statements is considerable and calls for cautious judgment by the commercial poultry raiser.

# Safflower Meal Digestion Tests

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

Harold Goss and K. K. Otagaki

**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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## FLUORIDE

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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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