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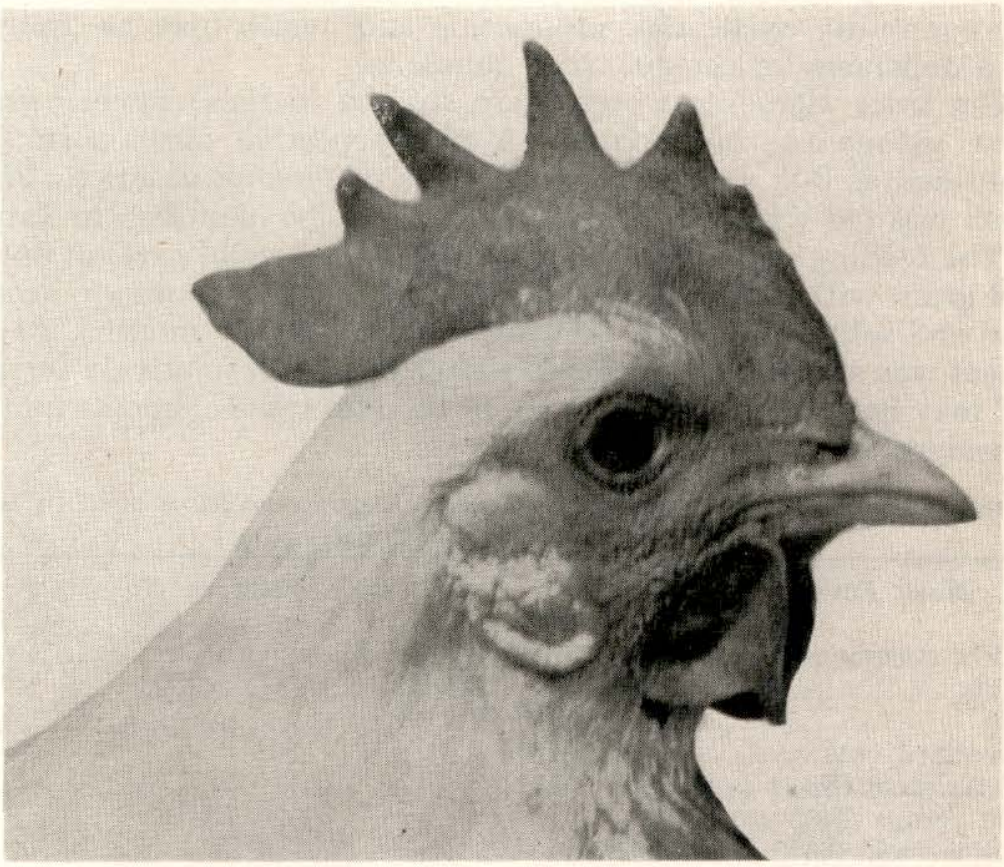

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The Agricultural Experiment Station of the University of Nebraska College of Agriculture
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Effect of Manganese and Iodine Additions in a Specific Ration for Laying Hens

By F. E. Mussehl

THE importance of certain trace elements in rations for poultry is recognized. The necessity of adding these elements, however, probably depends upon the type of ration which is used in a particular region. Feedstuffs which are grown in different sections of the country may also differ in chemical composition, and the possibility exists that production and health may be limited by a deficiency of certain trace elements.

The trace elements which were studied in these experiments were manganese and iodine. A representative mash formula, identified as 8-S, was used as the basis of feeding practice. This mash was fed with grain mixture No. 211, also identifled in Table 1. The feeding practice consisted of the use of equal parts of mash and grain with access during the fall and spring months to green feed and soil in the yards. During the early spring months, green wheat was available, and this feedstuff grown on relatively fertile soil may have been a good source of the two trace elements under consideration.

TABLE 1.—*Representative mash formula and grain mixture used in this experiment as basis of typical ration.*

*Mash Formula No. 8-S**	*Lbs.*	*Grain Mixture No. 211*	*Lbs.*
Yellow cornmeal	32	Whole yellow corn	50
Shorts	20	Wheat	25
Bran	10	Barley	25
Pulverized oats	10		
Alfalfa meal (No. 1 quality)	10		100
Meat scraps (50% protein)	5		
Sardine meal (68% + protein)	5		
Soybean oil meal	5		
Limestone	2		
Fine salt	1		
	100		

* From November 1st to April 1st—1% fish oil added to mash.

The general plan of the experiment was to approach the conditions which obtain on a typical Great Plains area general farm where corn, wheat, oats, barley, alfalfa and green feed during the growing season are considered the basic poultry feedstuffs.

Two hundred fifty Leghorn pullets of comparable breeding and physical quality were put in each one of three lots. The experiment started September 1, and was continued to June 1, making

a period of nine months. The control lot AB received the ration, as indicated, without any additions. Lot CD received in addition four ounces of manganese sulphate per 1000 pounds of mash, and Lot EF received manganese sulphate at the same levels as was provided for Lot CD with the addition of two parts of stabilized potassium iodide per million parts of mash, this being the amount recommended by most research workers.

Management practices were aimed to be similar to those which would be followed on a typical poultry farm or general farm, except that all birds were trapnested for the experimental period.

A representative number of eggs from each lot were weighed during the months of January, February, and March, and a representative sample of eggs from each lot was also hatched. A summary of egg production, egg size, hatchability, mortality, and birds culled, is given in Table 2. Birds were culled when they were obviously in a condition which would make their presence a hazard to the remainder of the flock, this being in conformity with recommendations made to poultry producers who maintain flocks for market egg production.

TABLE 2.—*Production and Hatchability Data.*

No. hens to start	Pen AB 250	Pen CD 250	Pen EF 250
Variable	No. additions	Mn	Mn + I
Production average per hen.... (Hen day basis for 270 days)	143	143	146.3
Deaths	16	15	18
Culled	24	26	24
No. eggs set (Feb. & March)....	2592	3126	3404
No. chicks hatched	1719	2166	2121
No eggs weighed (Jan., Feb., March)	1871	1973	1901
Percentage hatch (all eggs set)	66.31 ± 4.50	69.28 ± 4.40	62.30 ± 4.45
Average weight (gms.)	57.3 ± 0.09	57.2 ± 0.07	57.3 ± 0.06

Conclusions

This preliminary experiment does not answer all of the questions that are presented about manganese and iodine requirements. It can only be taken to indicate that for a typical situation with a typical ration of the type that many poultry producers use, there was no satisfactory evidence that egg production, hatchability and the viability of the hens was limited by manganese and iodine in the ration.

The cost of manganese and iodine additions, however, is not great, and there is occasionally a possibility that the inclusion of these trace elements at the levels used in these experiments is desirable. With other base rations containing less manganese and

iodine, the necessity for their additions may be greater. Fish meal, meat scraps and alfalfa meal are all good sources of manganese, and fish meal of the type used in our ration is an excellent source of iodine.

Under average conditions, the cost of adding four ounces of manganese sulphate per ton of ration, which is the usual recommendation, should not exceed three cents per ton. The cost of adding two parts of potassium iodide per million pounds of mash should not exceed one-fourth of a cent per ton of mash. The inclusion of these ingredients, therefore, at the levels sometimes recommended as a safeguard, will not justify an increase in cost of more than one-fifth of a cent per 100 pound sack of mash.

References

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