

The Unsolved Quantity of Life

By JAMES J. EMERY, '25

Recent Investigations in Feeding and Handling Baby Chicks Show That Leg Weakness and High Mortality Can Be Decreased in the Flock by Supplying Certain Vitamines Which May Be Lacking in the Diet

WHEN one speaks of vitamines, "the unsolved quantity of life," he or she is speaking of something whose composition is not known, either chemically or physically by the best informed nutrition investigators.

It has been the common method in the past to associate the vitamines and class them according to their effect upon man. And as a result of this, there has been definitely classified up to date four distinct vitamines.

Fat soluble A, a lack of which causes an eye disease known as Xerophthalmia, is present in butter, egg yolk, milk, and to a more limited extent in green stuff and tubers. Water soluble B, a lack of which causes a nervous disease called Beriberi, is found in seeming abundance in the outer covering of most grains, milk, green leaves, and fruits. There seems to be no lack of this vitamine in the diet of the Anglo-Saxon races, but in the Oriental races where rice is one of the main foods, there was a serious loss of life at one time due to the fact that the rice crop was sold to Saxons and was brought back as polished rice. Water soluble C is a vitamine with a history in the North, as the lack of it causes scurvy. It is found mostly in tubers and fresh fruits. Thus one can see why in the North scurvy was such a prevalent disease for years. Vitamine D, or "Bottled Sunshine," as it is sometimes called, is probably one of the most important vitamines in our every-day life. A deficiency of this vitamine causes Rickets. Authorities estimate that 85% of the population has at some time, between the ages of one and two, been troubled with a lack of this vitamine. The sources of this life essential is milk, and cod liver oil, which seems to have a great abundance of it.

A recent vitamine to be brought to light is one called vitamine X, and is thought by the scientific world to function in the reproductive power of the individual. As yet little is known of this recent addition to the established class of vitamines.

Recently investigators have turned their attention to the effect of vitamines on other animals besides man, and notable results have been secured, especially by those investigators who have used poultry as their subjects. As a result of these investigations, it appears that A and D are the most important ones of the groupings, or are most likely to be lacking, and rations reinforced in these two essentials have given striking results. Experiments at the Cornell University along this line, as reported by Dr. G. F. Heuser, who has charge of poultry nutrition at that institution, show that a lack of vitamine A causes a disease very similar to roup, while a disease known as Coccidiosis is very easily acquired, due to the animals' lowered resistance.

The following results of experiments conducted at Cornell University are reported, not as an extended study of this problem, but as showing some interesting and valuable indications obtained from preliminary work. Attention should be called to the fact that the chicks in these tests were kept under conditions unfavorable for the best development. Approximately fifty chicks were placed in each compartment of a pipe steam brooder. The hover of each was two feet in diameter, with a runway of four by eight feet. A cut-straw litter was used on the concrete floor. The chicks were never outdoors, and received no direct sunlight. All groups received the following feeds:

Mash—

- Two lbs. corn meal;
- One lb. wheat bran;
- One lb. wheat millings;
- One lb. mea tscraps.

Grain—

- Five lbs. cracked corn;
 - Twenty-one lbs. cracked wheat;
 - One lb. steel-cut oats.
- This was changed later to six lbs cracked corn and four lbs. of wheat.

The five lots here reported were managed as follows:

Lot No. 1 received only the feeds indicated above.

Lot 2 received, in addition to the regular ration, two teaspoons of cod liver oil daily.

Lot 3 received, in addition to the above feeds, some green food daily.

Lot 4 received, in addition to the regular ration, two teaspoons of cod liver oil and some green food daily.

Lot 5 received, in addition to the regular ration, two teaspoons of cod liver oil and some green food daily, besides having skim milk to drink at all times.

The green feed used was chiefly sprouted oats. Attention needs to be called to the fact that the supply of green feed was quite limited, but equal for all pens.

After 8 weeks of age, all pens received the same management, namely, the regular ration, green feed, milk and cod liver oil.

The pens began to show the effect of Coccidiosis when about 4-6 weeks old.

WEEKLY MORTALITY TABLE

	Lot 1 No.	Lot 2 No.	Lot 3 No.	Lot 4 No.	Lot 5 No.
First week.....					
Second week.....	2	1		1	
Third week.....		1			
Fourth week.....					t
Fifth week.....	1		1		
Sixth week.....	5		1		
Seventh week.....	14		19		
Eighth week.....	8	7	9	1	
Tenth week.....	6	8	4	7	
Eleventh week.....	3	3	2	3	
Twelfth week.....					
Thirteenth week.....					
Now alive.....	6	21	10	30	49

Note—Death in all cases was diagnosed as being due to Coccidiosis.

At the Wisconsin station, for example, repeated tests have shown that chicks kept constantly in wood-floored yards, with no litter but planer shavings, and fed on a certain ration, would promptly develop leg weakness, and within a few weeks all die. Other chicks kept under the same conditions and on exactly the same ration, with the simple addition of vitamine D in the form of egg or cod liver oil, would practically all live. It was also found that chicks on the same ration, without vitamine D, but with daily exposure to direct sunlight, could be reared with equal freedom from leg weakness.

(Cont'd on Page 17)

THE UNSOLVED QUANTITY OF LIFE

(Cont'd from page 7)

These investigations at Wisconsin indicate that a well balanced ration, such as regularly fed by well informed poultry keepers, supplies a sufficient amount of vitamine D to meet the normal requirements of the chicks, when they have plenty of sunlight.

In studying the requirements of growing chicks for vitamins A and C at the Illinois Experiment Station, the experiments indicated that the chicks would thrive very well on rations lacking vitamine C, but that they definitely required vitamine A. It was further found that chicks showing symptoms of leg weakness on rations deficient in either A or C could be brought back to good condition through the administration of cod liver oil (supplying vitamine D), whereas all chicks of this group that did not receive cod liver oil died or became so emaciated that it was necessary to kill them.

At present cod liver oil and eggs are regarded as the most efficient and economical sources of vitamine D. They also contain vitamine A, and, as vitamine B seems to be supplied in ample quantity in any well balanced ration, and vitamine C not being regarded as highly im-

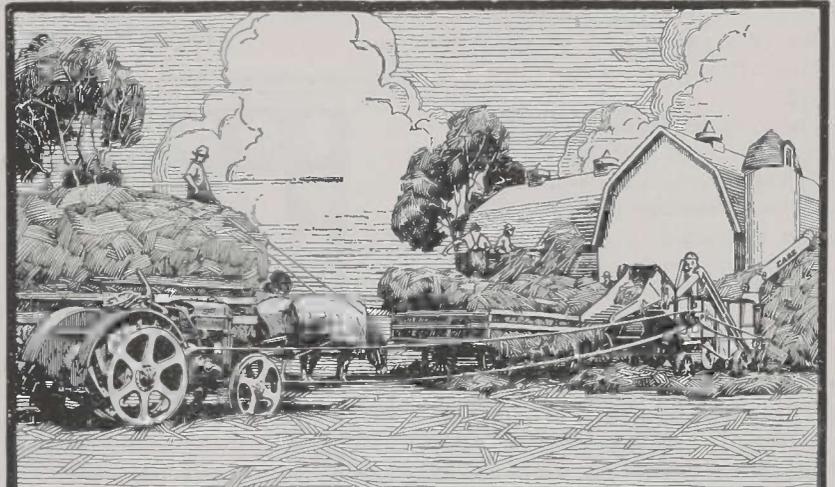
portant, those whose chick rations carry cod liver oil or egg have hardly any occasion to worry about the vitamins under any conditions.

TO ENLARGE DATE PLANTINGS AT THE YUMA MESA EXPERIMENT STATION

According to D. W. Albert, of the University of Arizona, the work of setting out offshoots on the Yuma

Mesa Experiment Station will begin some time next week, at which time the experiment station's plantings will be increased to a considerable extent. The ultimate aim is to establish 10 acres of marlatt-free Deglet Noors.

Fourteen trees with offshoots attached have been purchased from the old Bernard Johnson orchard, near Yuma, for this purpose.



Three Steps Toward Profit

You are three long steps nearer to bigger farm profits when you own a Case steel thresher:

1. You can thresh at your convenience, with less help in field and home, for twenty years or more. This cuts expense to almost nothing.
2. You can avoid the losses caused by weather, birds, rodents and poor threshing. You can thresh earlier, when the grain will make the highest grades. You can get the most out of your crop.
3. You can do the same good work for some of the neighbors. Custom work with a Case pays you well for your time—in cash.

Seven sizes of Case steel threshers give you these advantages:

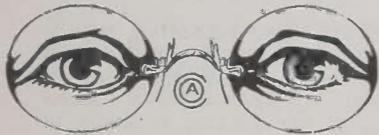
- Simple construction. No unnecessary parts to wear. Great capacity for power required.
- Ease and certainty of adjustment for good threshing of all grains and seeds. Any farmer can operate a Case successfully.
- Great strength and rigidity, due to 83 years of experience in building threshers, assures dependable performance and long life.
- Price. Because of volume production the many advantages of Case threshers can be secured at highly favorable prices.

J. I. Case Threshing Machine Company

Established 1842 Incorporated
Dept. E75 Racine Wisconsin



Good equipment makes a good farmer better



Eyes Examined for Glasses
Lenses Duplicated

Drs. Schell & Schell

Optometrists and Opticians

P. O. Box 966 Tucson, Ariz.

Battery Recharged

and a rental battery furnished
50 CENTS

A new battery, guaranteed for one year,

\$15.00

Leo. Goldblatt

199 North Sixth Ave.
Phone 1724