

The **POULTRY** **HEALTH**

Messenger

FEATURED IN THIS ISSUE

Worming Number

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JULY-AUGUST, 1934

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For Those Who Fail

By JOAQUIN MILLER

"All honor to him who shall win the prize"
The world has cried for a thousand years,
But to him who tries, and who fails and dies,
I give great honor and glory and tears.

Give glory and honor and pitiful tears,
To all who fail in their deeds sublime,
Their ghosts are many in the van of years,
They were born with time in advance of time.

Oh, great is the hero who wins a name,
But greater many and many a time,
Some pale-faced fellow who dies in shame
And lets God finish the thought sublime.

And great is the man with a sword undrawn,
And good is the man who refrains from wine,
But the man who fails and yet fights on,
Lo! he is a twin-born brother of mine.

Outlook for Profits From Poultry Are Distinctly Brighter

Even during the earlier part of this year when egg and poultry prices were very low compared with feed prices those poultry raisers who took good care of their birds made a satisfactory profit on their flocks.

There is for instance Mrs. Forest Jones, a Kentucky farm woman who realized \$54 from 123 White Rock cockerels at the age of 12 weeks, or \$2.88 more than it cost to raise 280 chicks to that age and she still had 109 pullets and 40 cockerels left on the farm.

Another farm woman in the same state, Mrs. Mayme Applegate, made a profit of \$3.62 on her 300 Rhode Island Red chicks by the time they were 12 weeks old and had 75 pullets left.

The success of these farm women was due largely to the fact that their chicks came from hens that were blood tested for bacillary white diarrhea, that they were raised in sanitary surroundings and were fed a balanced ration. The chicks were also early hatched so that broilers could be sold when the market was still comparatively high.

If such a showing was possible during the past spring, there will be even greater profits in sight for progressive poultry raisers this fall and winter if they will carefully guard the health of their birds and otherwise give them proper care. Eggs and poultry prices have already taken a very decided jump, and they will increase a great deal more. Hog and beef prices are the highest they have been for years and whenever other meat prices are high, poultry prices always fall in line.

In its Midsummer Poultry and Egg Outlook released on August 16 the United States Department of Agriculture has this to say about the prospects for fall and winter:

"The supply of fresh eggs during the coming fall and particularly during the winter will fall considerably below last year, owing to fewer layers and to the scarcity and high price of feed. Farm prices of eggs during recent months have been higher than a year ago, and prices this fall are likewise expected to be higher.

"The number of hens and pullets of laying age in farm flocks on August 1 this year was . . . the smallest since the record was begun in 1925. With the number of hens 3 per cent smaller than last year on August 1, with a decrease in number of pullets raised, and with the heavy marketing of hens and pullets in the drouth area, the production of eggs during the early fall will probably be at least 5 to 10 per cent less than in that period last year, and production of eggs in the late fall and winter will likely show an even greater relative decrease. . . .

"The seasonal advance in egg prices throughout the remainder of 1934 will probably be greater than normal. Production will be smaller and the depressing effect of storage supplies will not be greater than was the case in 1933. Egg prices also tend to rise with general advances in the level of prices of feed commodities."

It will therefore pay poultry raisers handsome returns if they will give their flocks the best of care and attention from now on. It is necessary especially to look after the health of the birds, because disease will make profits from poultry impossible, no matter how high the market may be.

Dr. J. E. Salsbury

Worms in Chickens and Turkeys

An Illustrated Article on How to Check and Prevent Losses From Worms

The Worm Problem

THERE is no greater all-year-round problem in poultry raising than worms. By worms we mean the active, living parasites in the intestinal tract that depend entirely upon the food and intestinal fluids of the chicken for their nourishment.

There are three general classes of intestinal worms: 1. The ordinary roundworm which floats free in the intestinal canal. It is white in color and quite easy to see; 2. Tapeworms which are flat and segmented or beaded and firmly attached at one end; 3. The small worms that cannot easily be seen without magnification. These include some species of tapeworms and capillaria worms.

Worms are very prolific. They lay eggs by the millions. Over ten thousand eggs have been found in the body of one female roundworm. Nearly nine-tenths of the worm's body is made of egg laying organs, and the power of reproduction is beyond comprehension. This means that all the droppings passed by wormy birds are well mixed with worm eggs and wherever poultry droppings are deposited the seed for more worms is deposited also.

Speaking from a microscopic standpoint an old poultry yard is literally knee-deep in worm eggs. Clean ground may easily be contaminated by droppings carried by roving animals and birds and anywhere else to which droppings may adhere. They may also be carried by dirt and straw that are blown by the wind. One must keep these things in mind in order to better understand the problem of worm control.

Since worms may abound everywhere constant vigilance must be kept, both from the standpoint of internal medication and of poultry yard sanitation. Greatest activity must be planned in old poultry yards but even on clean ground the problem cannot be passed up and must not be neglected.

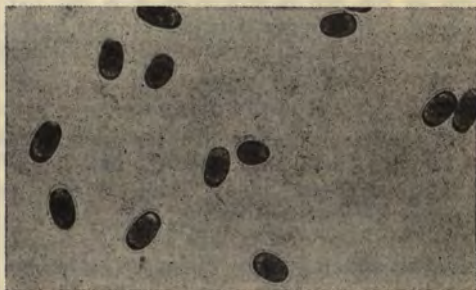
Damage Done by Worms

Worms do damage in three ways. First: They take up the food and nourishment for their own heavy egg production that would otherwise go to growth and development of the chicken. This is more serious than it sounds at first because worms do not live on the corn and feed in the intestinal tract but they live on the fluids that have already been digested and worked upon by the intestines. In other words, they take the very cream of the food and leave the poorest quality for the chicken to use. Other things being equal, chickens when they are wormy have

to eat a great deal more and handle much more waste in their intestinal tract in order to get the amount of nourishment they need for their own bodies.

Second: As if food robbing was not damage enough worms leave behind their own bodily excrements which are actually poisonous to the chicken. The body wastes from the worm destroy the blood of the chicken. This makes the heart and other muscles weak and flabby. It fades the color of the eye, beak and legs and damages the whole system in proportion.

Third: The worms cause a mechanical irritation and even may puncture holes in the intestine. The worm eggs are hatched and the young worms develop in the folds of the intestines where they cause a great deal of irritation and upsets of digestive functions. As a result of these damages wormy birds may go blind, become lame and paralyzed, act dizzy, lose flesh and become thin, produce intestinal inflammation resulting in diarrhea and



Eggs like these are produced by the millions in each female worm.

lowering the vitality of the chickens so that they are more susceptible to coccidiosis, roup, colds, tuberculosis and other diseases.

Worms in Young Chicks and Poults

The delicate young chick is particularly susceptible to worms. This has been shown by scientific experimentation. During the first two or three weeks of life the chicks may actually die from the damage done by the young worm embryos that have hatched out in the intestinal tract. As the chick becomes half grown the damage may not be great enough to kill it outright but the scrawny appearance, the run down condition, lack of flesh but more important the weakness of the heart and internal organs will positively keep the bird from developing into a good fowl if the worms are not removed.

If the stock that is about half grown is not in good weight or growing as it should, be on the lookout for worms and start them immediately on the proper worm treatment. Use the chick size Worm Caps when chicks are from 10 to 16 weeks of age. After that use the adult size Worm Caps.

Wormy stunted chicks and poults do not have a chance in the competition for early development and heavy production that is demanded of them by the modern poultrymen.

Worms in Adults

The full grown bird has more resistance against worms and is better able to protect itself. Yet the constant production of poisons within the intestines will sooner or later break down the vitality if the worms are not removed. Laying hens will lay more and larger eggs and continue in production more regularly if they are free from worms. Worm-free chickens do not have as much trouble with



Chick to the right given worm eggs. Left—Chick of same age raised free from worms. (After Ackert.)



(Left) Large masses of roundworms in the opened intestine indicate the great activity of these parasites.



(Right) Young worm embryo penetrating the glands between the villi of the intestines. (After Ackert.) Few people realize the damage done by worms at this early stage.

diarrhea, loose bowels, prolapses, inflammation below the vent and the subsequent cannibalism. All these conditions are extremely worthy of consideration in planning for a healthy flock.

As long as the hen is still alive it is not too late to remove worms. The longer it is delayed the longer it will take to restore the health. Do not delay in ridding the flock of worms.

Roundworms

The so-called roundworms are the most common in poultry. They are easily seen when the intestine is opened after the bird has been killed. They are dead white in color and may be seen as round, wiry, smooth objects with pointed ends varying in size from $\frac{1}{2}$ to $3\frac{1}{2}$ inches in length. The size naturally varies with the age but in addition to this it has been observed that the fewer the worms the larger they are apt to be.

Roundworms produce an oval shaped egg with a thick, heavy covering for protection. This egg hatches out in exactly the same manner that a chicken egg hatches and the young worm digs a hole through the shell. Worm eggs remain uninjured in the soil for many months. They stand cold weather exceptionally well but are more easily injured by direct sunshine and drying. Roundworms are usually found in the intestinal loop just back of the gizzard. Sometimes they are found farther back, and once in a while a few may be found in the gizzard or in the ceca.

Roundworms are damaging to fowls of all ages, but especially to the young chickens. The eggs are picked up with the feed and hatch in the intestines and they proceed immediately to do an immense amount of damage. In about four weeks the worms are mature and ready to produce eggs.

Roundworms are found in nearly all classes of animals but roundworms found in one kind of animal do not seem to infect other farm animals. Yet the conditions under which worms develop in poultry are also ideal for development of worms in hogs as well as dogs and cats.

How Roundworms Develop

To understand the development and damage done by roundworms study the picture above. In the upper right hand corner the walls of the intestine are shown. The greyish streaks downward and to the left are the villi of the intestines. The firm shaped object near the center having the small dots is a young worm just recently hatched. Notice how it is penetrating between the villi and how its head part has gone clear to the roots of the villi right next to the intestine itself. Apparently it is getting some of its nourishment there. This is from an actual photograph taken through a microscope.

Young worms require the protection of the villi and the nourishing juices of the intestines for development. After

they become large enough to take care of themselves they leave the villi and remain free floating within the intestine.

What to Do for Roundworms

When roundworms alone are present the most specific method of attack is to use Dr. Salsbury's Nicotine Caps. These Nicotine Caps are very excellent because they contain the proper amount of nicotine for the average dose and are safest for the birds. Follow the general directions given for the individual treatment on the next page.

After the worms have been removed follow the worm prevention program given on page 10.

For young birds 10 to 16 weeks of age use the chick size Nicotine Caps and for older birds use the adult size. In badly infested flocks it would be a good plan to repeat the treatment in 2 or 3 weeks if necessary. Since the worms are just as alive and active as are the chickens it is not always possible to remove all the worms at one time. Roundworms also begin to develop just as soon as new eggs are picked up and that is why a prevention program is just as necessary as the worm treatment itself.

After much experimental work nothing has been found that is superior to the proper dose and proper combination of nicotine given in coated tablets. Coated tablets are the easiest to give. They deliver the medicine to the seat of trouble without effort or bother on the part of the person doing the work.

Tapeworms

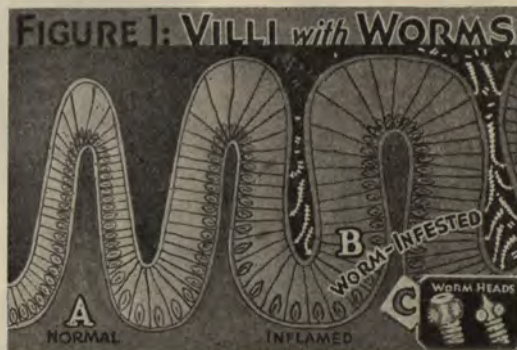
Tapeworms have no relation whatever to roundworms. Outside of the fact that they live in the intestines and do similar damage they have no relation whatever to the roundworms.

Tapeworms are attached to the intestines by means of hooks and suckers. By means of these suckers portions of the intestines are grasped and from then on the function of that portion of the intestines is destroyed. When thousands of worms are attached to the same intestine it is easy to understand that a great deal of its functions have been taken out of active usefulness.

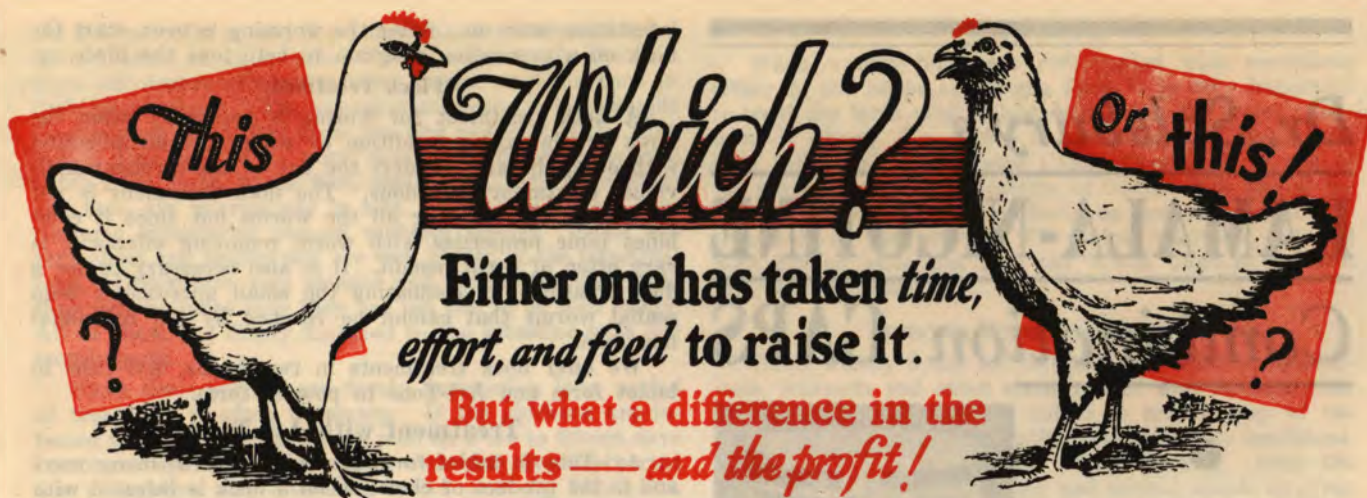
Tapeworms produce blood poisons or toxins. That is why birds infested with worms are usually pale. There are a great many different varieties of tapeworms. The varieties are recognized partly by the shape of the segment but more completely by the construction of the head. Some tapeworms have more highly developed suckers and more hooks and consequently are able to fasten themselves to the intestine more securely than the tapeworms with poorly developed suckers. That is why some tapeworms are much more difficult to remove than others.

How Tapeworms Develop

Tapeworms are not spread directly from one chicken to another but have to pass through what is called an intermediate host. To start with each bead or segment of the tapeworm is practically a complete animal in itself and when mature is a large egg bag. Complete sets of reproductive organs are developed in each one of these beads. They produce eggs for a long time and finally



when they are passed out with the droppings each bead is full of eggs which are scattered when the covering of the bead dries up. These eggs are alive already and under



the microscope one can usually see three well shaped hooks that move within the covering or egg shell. These worm eggs are eaten by flies, slugs, snails, earthworms, grasshoppers, etc., where they go through a certain development. This is quite necessary before they can reinfest poultry. When chickens eat any of these insects, etc., that have consumed tapeworm eggs they will become infested with young tapeworms. They will not become infested from eating the eggs that have not been picked up by these intermediate hosts. This means that in combating tapeworms it is important to keep the chickens away from flies, grasshoppers and other lower forms of life that may be carriers of tapeworm embryos.

What to Do for Tapeworms

For the removal of tapeworms only one drug stands out as being of merit and that is Kamala. Other drugs have been tried with very little success. Since the tapeworms are so firmly attached to the intestines it is even difficult to get all the worms with any one treatment.

In treating for tapeworms it is particularly well to keep in mind that retreatment may be necessary in chickens just as it is in treating humans for tapeworms. Use Dr. Salsbury's Kamala Caps when tapeworms alone are present. The Kamala Caps should be given when the crop is nearly empty and may be followed with a dose of Epsom salts. Even though Kamala itself is a purgative the additional help in removing the worms afforded by the salts is of value.

Chickens in heavy production and those affected with tuberculosis, roup, coccidiosis or other diseases should be put on a flock treatment using Avi-Tabs and gotten into condition before the Kamala Caps are used.

How to Treat for Worms

Individual Treatment

For positive worm removal there is nothing superior to the individual treatment of each chicken with Dr.



Dr. Salsbury's worm caps are easy to give and easy on the birds.

Salsbury's Worm Caps. The treatment for roundworms and for tapeworms have already been described on previous pages. Since roundworms and tapeworms are very often found in the same birds at the same time popular opinion demands that one treatment be arranged that can be used for both kinds at the same time. The combination of Kamala and Nicotine in Dr. Salsbury's Worm Caps

which are properly coated to deliver the medicine in the proper place is the one in greatest demand and the method of use will be described here. The good results obtained, the safety to the bird and the convenience makes this a desirable and popular treatment.

In simple cases of worm infestation merely put one Dr. Salsbury's Kamala-Nicotine Combination Caps into the bird's mouth and push it down back of the tongue so the bird will swallow it and the job is over. Birds can be wormed as fast as they can be caught and handed to the person doing the worming. Worm the birds when they are handled for culling, testing, delousing or moving from one building to another. It takes so little time and is so inexpensive that no one can afford to have wormy birds or suffer the losses from worms.

In the more complicated cases where intestinal inflammation is present give a treatment of Phen-O-Sal in the drinking water. Use 8 tablets per gallon for a period of three days before giving the Worm Caps. This allays intestinal inflammation, cuts the mucus and gives the worm medicine a better chance to reach the worms and it also makes worm removal much easier on the birds. While the Worm Caps may be given at any time of day or night it is more satisfactory to give it in the middle of the morning after a very light feeding. As soon as the Worm Caps have been given provide plenty of water. This helps to move the Worm Caps along and helps to dissolve it at the proper place. A little grain feed may be given an hour or two after worming.

Damage may be done from worming if the crops are left empty and water is withheld. A light dose of Epsom salts 24 hours afterwards is highly desirable and is recommended. Even though it is not absolutely necessary. After the salts have acted clean up all the droppings and all the litter, move it out to be burned. This gets the worm eggs and the worms that will be dangerous to re-



(Above) Greatly enlarged head of a small tapeworm as seen through the microscope. The "eyes" are large and act as suckers. The "nose" is pointed and very movable.

(Below) Large tapeworms attached to the intestines.

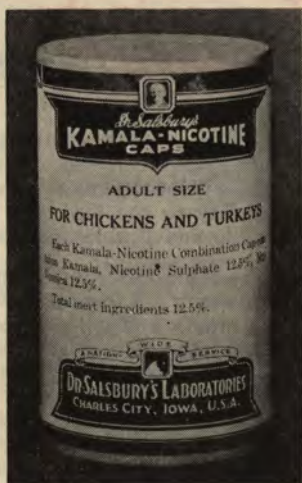


Dr. Salsbury's KAMALA-NICOTINE Combination CAPS

Contain Nicotine and Kamala in proper combination and with suitable coating to protect the ingredients.

Preferred by Thousands of Poultry Raisers

**CONVENIENT
ECONOMICAL**



There Is Always Danger

From

COLDS, BRONCHITIS AND PNEUMONIA

These ailments call for

Dr. Salsbury's

CAM-PHO-SAL

Widely used as a medicated spray that penetrates to the mucous membrane of the breathing organs and heals the inflamed tissues.

Also used for washing out the nostrils, mouth and eyes in a solution of 2 tablespoonfuls CAM-PHO-SAL in one-half pint of warm water.

The nasal passages may be cleansed with this solution by the use of a nasal irrigator.

CAM-PHO-SAL is a powerful antiseptic and may be used for treating common sores, wounds, etc., by mixing two teaspoonfuls CAM-PHO-SAL with one-half pint water.

For canker, sores, scabs, etc., CAM-PHO-SAL may be used full strength to swab the affected parts.

infestation later on. After the worming is over, start the flock on a prevention program to help tone the birds up.

Flock Treatment

A flock treatment for worms is necessary when the birds are in laying condition or where the complication with other diseases renders the use of the stronger individual treatment hazardous. The flock treatment is not as efficient in removing all the worms but since it combines tonic properties with worm removing effects it is very often of great benefit. It is also necessary to use a flock treatment in combating the small microscopic deep seated worms that cannot be reached by the individual treatment.

We offer flock treatments in two forms, Avi-Tabs in tablet form and Avi-Tone in powder form.

Treatment with Avi-Tabs

Avi-Tabs in tablet form are convenient in many ways and is the product of choice when a flock is infested with the microscopic tapeworms and capillaria worms. As an average treatment use one Avi-Tab to every five birds (20 tablets per hundred) as a daily treatment for five days. Set the Avi-Tabs to soak in a quart jar the night before. In the morning mix the contents of the quart jar with sufficient mash for the birds to clean up in two or three hours time. Give the mash while the birds are hungry the first thing in the morning. A large quantity of the medicated mash introduced into the intestines at one time gives much better results than a little nibble now and then. After the medicated mash has been consumed continue the usual feeding for the balance of the day.

Some flocks are finicky about their eating and do not take medicine very well. Foods that this flock relishes particularly well may be mixed with the medicated feed. Molasses, alfalfa meal, cracked corn, semisolid buttermilk, etc., are useful for this purpose.

The frequency of the treatment will depend upon the way the birds respond. If the five day treatment has not straightened out the condition repeat with another five day treatment immediately. Also check for any complication that should be treated at the same time. A five day treatment with either Phen-O-Sal or Rakos may be interspersed with the Avi-Tab treatment.

Treatment with Avi-Tone

Avi-Tone powder is a product of choice when combination of tonic with roundworm removing properties are desired. It may be given in a wet or dry mash. For best results use five pounds of Avi-Tone to every 95 pounds of mash and give this either wet or dry the first thing in the morning for five consecutive mornings each month. For the balance of the month give the same quantity of Avi-Tone in the mash for two consecutive mornings each week. For growing stock smaller quantities of Avi-Tone may be used. Avi-Tone may be used in this way every month in the year. Complete directions are on every package.

Either one of these flock treatments will not interfere with egg production and if properly carried out they will increase the appetite and vitality of the bird so as to make high egg production possible. They may be used in high producing and in breeding pens as well as in young stock that is being prepared for high production. It may also be used in battery and fattening stock. Avi-Tone is a real money maker when used for the purposes intended.

Microscopic Worms

There are many worms so small they cannot be seen without magnification. Sometimes it is hard to believe



Microscopic tapeworm found in many cases of paralysis. (1) The part of the head where hooks are located. (2) Suckers. At the left a segment is ready to drop off.

out it is actually so and if a person has a microscope there is no trouble at all to prove this statement. In the first place all worms are microscopic in size at some time in their development. The young roundworm is microscopic in size when it hatches from the egg and that is the time that it does some of its worst damage. All the tapeworms hatch from cysts in the flies, snails, etc., they have eaten and then are microscopic in size. But some worms particularly tapeworms remain midgets always. Some are very short and stubby and are well hidden in the intestinal folds. Others are very slender and thread-like and while they may be quite long they are too fine to be seen easily. All of these are firmly fastened to the intestine with the mouth parts.

Since these worms are firmly fastened a long period of treatment is often necessary. If the chickens are infested with microscopic worms plan on a ten to fifteen days treatment with Avi-Tabs. Then with each five day period use a laxative and intestinal healer such as Pen-O-Sal. The persistent application of the proper treatment will get results.

Capillaria Worms

These are round, small, slender worms that live in the intestines just back of the gizzard. They lay millions of eggs characterized by their lemon shape and little rings on each end. These worms also fasten to the intestines. They cause much inflammation and the pouring out of mucus from the intestines. In the treatment of capillaria worms first use the Nicotine Caps, then follow with the flock treatment of either Avi-Tone or Avi-Tabs. Keep it up for a period of at least two weeks.

Gizzard Worms

These are round, spiral-shaped worms, white to reddish in color. They burrow through the lining of the gizzard, may be found in coils underneath the gizzard lining and throughout the muscles. They are more common in the south than in the north.

The attack on gizzard worms is largely through prevention as outlined for roundworms. They are extremely difficult to remove because they are hidden under the lining.

Cecal Worms

The small round worms found in the ceca are probably of less importance than the others named. They do indicate the presence of worms however and treatment should be given for worms in general. Cecal worms may also carry other infections particularly in turkeys. The flock treatment of Avi-Tone or Avi-Tabs helps to check the cecal worms but for specific control inject a teaspoonful of Dr. Salsbury's Worm Oil at the point where the ceca join the large intestine. This is done by inserting a rectal syringe 2½ or three inches into the rectum of the bird to be treated.

Worm Complications

When a flock of chickens are affected with worms only the treatment as previously outlined in this article is easy to follow and the results are nearly always very gratifying. When flocks have several diseases at the same time it is a problem of identifying all of these diseases and planning a treatment for each disease found. Since wormy birds are low in vitality complication with other diseases is very common and one should always be on the lookout for these complications in planning a worm treatment.

Roup

When wormy birds are complicated with roup in its various forms take extra precaution to build up the strength of the birds with a few days of Avi-Tone treatment before the Worm Caps are used. Then vaccinate with the Mixed Bacterin to build up immunity against the germs and if pox or bronchitis should be present vaccinate with these two specific vaccines. Spray with Cam-Pho-Sal, clean out the nasal passages at the same time the worm treatment is given.

A thorough and complete treatment pays.

Coccidiosis

When wormy birds are complicated with coccidiosis either in the acute or chronic form it is very important to treat the birds with Rakos even before the worm treatment is given. Use a five day treatment of Rakos and then follow with the Worm Caps. Coccidiosis is one of the most common complications of worms, it is one of the reasons why some wormy birds do not respond to the treatment as they should. The Rakos treatment followed with Epsom salts and then the Worm Caps is an ideal program of attack.

Tumors, Tuberculosis, Etc.

When wormy flocks are affected with tumors, tuberculosis, leukemia and other conditions of that character the flock should be thoroughly culled to remove any of the birds that may be affected with these incurable conditions. The culls should be disposed of by burning. Only the birds that appear quite healthy and normal should be given the worm treatment. The premises should then be thoroughly cleaned and disinfected and the worm prevention program should be inaugurated to maintain good health. When chickens become thin and linger on for days and weeks be sure to examine them for these complications and if you find either tumors or tuberculosis you will know that it is going to do no good on spending money on worming such birds. Save the medicine and money for use on the ones that have worms only and kill off those that are affected with either tumors or tuberculosis.

A Prevention Program Pays

Worms are always on the job. Worm eggs may be found almost anywhere. They are waiting to be picked up by the chicken so they can complete their life process. Since these parasites are continuously seeking to enter the chicken it is highly necessary that the poultry raiser be just as continuously on the job to prevent them getting into the birds and getting a start. By understanding the worm problem thoroughly a poultryman is in much better position to combat worms.

In a prevention program sanitation must not be neglected. Regardless of the treatment used the infection can easily become so great that it will overcome all the effects of the medicine. Clean the poultry house frequently, burn the litter or scatter it far away from places frequented by poultry. When scattered in the field it should be plowed under as soon as possible.

Disinfect the poultry house at least once every month during the year. The double yarding system is very excellent but even on the ordinary farm where poultry is turned loose one can often arrange to move the buildings from one corner to another. Buildings with cement floors should be provided with cinder runs around buildings where grass will not grow. The rest of the yard should be seeded to grass or other green crops and the chickens should be kept off long enough for the grass to get a good start.

For Severe Worm Infestations

When birds are severely infested with worms and when there is no anxiety about production the following method of worming is often used:

Individual Treatment: Confine the birds in the evening.

(Please turn to page 10)



As part of your prevention program use Avi-Tone in the mash as described on page 6 under "Treatment with Avi-Tone."

CHOLERA

Mid-summer and early fall are the most favorable seasons for cholera and typhoid. Birds die suddenly on the nests and under the roosts. Fat, apparently healthy hens usually die the fastest. Very often it spreads through the flock rapidly so that dozens of birds die every night.

VACCINATION Prevents CHOLERA

Vaccination with

Dr. Salsbury's

CHOLERA-TYPHOID BACTERIN

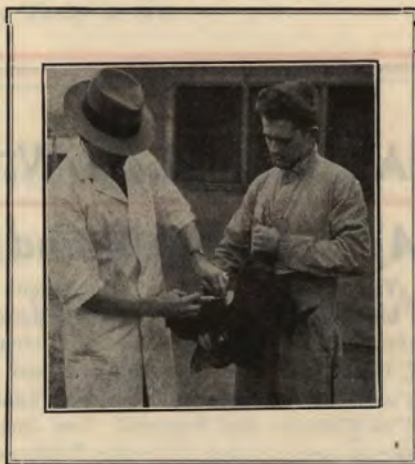
has proven extremely satisfactory in preventing and curing cholera and typhoid in poultry. It usually stops the majority of the losses in 24 hours and by the end of the week no more losses are noted.

The Bacterin is injected under the skin with a needle and syringe. The job is very easy to do and very certain in action. As a rule one treatment is sufficient but a second and third dose can do no harm and on severely infested premises may be necessary. With Dr. Salsbury's BACTERIN you get one full c.c. for every dose you buy. Therefore, it becomes the most economical bacterin on the market. The larger doses give the best immunity.

Vaccination does not stop egg production nor hurt the meat for food. It does not make the birds sick and is safe to use anywhere. Government records show that more people are taking advantage of vaccination every year.

Bacterins are highly refined medicines. They are made under U. S. Government License No. 195 under the most up-to-date and careful methods to insure full strength for immunizing the birds. The full-sized dose and the superior strength in Dr. Salsbury's Bacterin means more immunity for the money.

(See page 15 for price)



It is simple and easy to vaccinate for cholera. Complete directions come with every package and the man whose name appears on the back of this magazine can help you get started on the vaccination program.

Worms in Chickens and Turkeys

(Continued from page 7)

Close all feeders and waterers. The first thing in the morning give each bird one of Dr. Salsbury's worm caps. Keep the birds confined during the day. After about two hours follow this with a laxative consisting of half a pound each of Epsom salts and baking soda for each 100 birds. Dissolve this in a small amount of warm water, adding as much water as the birds will consume in 2½ to 3 hours. (Ordinarily 1 to 1½ gallons.) About noon feed a small amount of grain. Use just enough feed to merely act as a slight excitant to the digestive tract, promoting muscular movement of the intestine and preventing the birds from becoming too restless from hunger. Late in the afternoon give the birds their regular feed. Water should be given soon after the noon hour.

The next morning the birds may go at liberty as usual. Clean the premises of all litter either burying it or storing it in a closed pit for ten to fourteen days. Apply to the floors and dropping boards boiling water to which lye has been added in the proportion of one can lye for every five gallons of water. Such treatment is very essential, especially in roundworm control, before the spraying is completed. The eggs of the roundworms are coated with a cement-like substance which is almost impossible to penetrate with a disinfectant. Spray the premises with one part of Dr. Salsbury's Mite Death Disinfectant to which three parts of distillate or light paraffin base oil have been added. Repeat this treatment in ten days. The repetition is essential because there may be some worms left in the intestinal tract which the first treatment did not remove, and if so they continue to develop and reproduce.

Flock Treatment: If the flock is in full lay, then the individual cap treatment is not advisable, because being rather drastic it will have a tendency to throw the birds out of lay. For the treatment of such a flock first give the birds a laxative consisting of half a pound each of Epsom salts and baking soda for every 100 birds. Do this early in the morning before the birds have eaten their regular mash for the day. Mix thoroughly five pounds of Avi-Tone to each 95 pounds of mash. Do not let the birds have any other food during the morning hours excepting the treated mash for a period of 5 days. Use grain in the evening. Repeat the laxative at the finish of the treatment. During the time of this treatment add 8 Phen-O-Sal tablets to every gallon of drinking water.

Note particularly the results obtained from this treatment by posting a bird or two after the treatment is finished. If all the worms are not removed, wait about ten days and repeat the flock treatment the same as before. After the flock treatment the litter is removed and the dropping boards and floors are cleaned the same as described under individual treatment.

All feed and water should be given in protected troughs and waterers, thus eliminating any possibility of infestation by carrying the pollutions from the premises to the birds.

Why a Worm Free Flock?

The advantages of a worm free flock are manifold. Only a worm free individual can develop the size, stamina and vigor that is desired in the heavy producer or the good breeder. The round, full breast, the broad back, the full face, the large clear bay eye and the healthy bright red comb can be found only in worm and disease free stock. Chickens with these characteristics will stand up under the heavy strain of forced production that is demanded today.

Since worms are at the foundation of most of the disease troubles, a flock raised free from worms is the very first step in good poultry husbandry. Since it is so inexpensive and easy to follow an all year round program there is no excuse or no reason why a poultryman should forego the advantages of a worm free flock.

WORMS Reduce POULTRY PROFITS!



The WORMY BIRD..

- Is unthrifty, sluggish, loses weight.
- ... Has a weak heart, weak intestinal organs, and flabby muscles.
- ... Lays poorly, or not at all.
- ... Is likely to go blind, or become lame or paralyzed.
- ... Easily contracts disease, and, having little resistance, is very likely to die.

If Your Flock Is Badly Infested Be Sure to Medicate the Water With PHEN-O-SAL!



Worms also irritate and inflame the intestines; in severe cases of worm infestation you will find it wise to put Dr. Salsbury's Phen-O-Sal Tablets in the drinking water to allay the inflammation, whether the flock or individual worm treatment is used. Be sure that you get genuine Dr. Salsbury's Phen-O-Sal Tablets by buying them in their original package. Your local Dr. Salsbury dealer will be glad to advise you concerning the use of Phen-O-Sal.

Worm Your Flock NOW With DR. SALSBUURY'S CAPS!

When you free your flock of worms you remove your biggest handicap to making poultry raising a real money making proposition. A serious worm infestation makes your birds more susceptible to many diseases and increases the mortality rate. And the birds that do live, lay smaller and fewer eggs than they would if you got rid of the worms. Perhaps your own experience bears this out; the experience of most poultry raisers does.

..... Be Sure of a Thorough Worming Job

A THOROUGH job of worming, however, REQUIRES SCIENTIFICALLY CORRECT PREPARATIONS. And you will find that Dr. Salsbury's line of caps provides you with the exact kind of caps needed to eliminate the kind of worms your birds have. Authorities agree that KAMALA



is the recognized ingredient for the removal of tapeworms; Dr. Salsbury's Kamala Caps contain pure Kamala powder and extract, equivalent to 15 grains per tablet in the adult size. Nicotine is the recognized ingredient for use in expelling large roundworms; Dr. Salsbury's Nicotine Caps contain the fully approved two grains of Nicotine per tablet in the adult size. Both the Kamala Caps and Nicotine Caps are available in chick and adult sizes.

Dr. Salsbury's Caps are properly coated to protect the ingredients and to assure freshness. They are easy to use, easy on the birds and low in price. In spite of every precaution which you may have taken in the way of sanitation, etc., it will pay you to worm your flock now. The quicker you act, the better. The presence of worms is not always evident and the damage they do is sometimes not apparent until it becomes very, very serious.



If You Prefer the Flock Treatment

● The flock treatment is preferred by many poultry raisers, especially for hens in heavy production. Many also like the flock treatment for growing birds because of its convenience. Either Avi-Tabs or Avi-Tone may be used. Dr. Salsbury's Avi-Tabs come in tablet form and are simply soaked in water and

mixed with the mash. Dr. Salsbury's Avi-Tone comes in powder form and can be mixed with either wet or dry mash. You merely feed the birds all they will eat of the medicated mash for five successive mornings.

See Your Local Dr. Salsbury's Dealer ... He Will

Be Glad to Help You With Your Worming Problem

● We suggest that you see your local Dr. Salsbury dealer whose name appears on the back page of this magazine.

Go to his place of business the next time you are in town. He has free literature which he

will be glad to give you and you will find his advice valuable in combatting your particular worm problem. He has the complete line of Dr. Salsbury's Caps on hand and will be glad to advise you concerning the kind of Dr. Salsbury's Caps to use.



The WORM-FREE BIRD..

- Is well-developed, full-bodied, healthy and vigorous.
- ... Does not easily contract disease and has the vitality to quickly throw off sickness.
- ... Lays steadily; lays fine, large eggs.
- ... Stands up under the heavy strain of the forced production demanded today.

VACCINATE NOW...

..Against ROUP and COLDS!

● You will also find it very convenient to vaccinate your birds at the same time you worm them. This is the time of the year when birds should be vaccinated against Roup and Colds with Dr. Salsbury's Mixed Bacterin. Birds may also be vaccinated at this time against Fowl Pox as well as Cholera and Typhoid. Our line of vaccines and bacterins now includes infectious Laryngotracheitis (Bronchitis) Vaccine. See your local Dr. Salsbury dealer because it will pay you to vaccinate now to prevent losses later.

Free Laboratory Diagnosis

When you have trouble from disease in your flock that you or your local service man cannot solve, send a typical bird or two to Dr. Salsbury's Laboratories, Charles City, Iowa. Here a complete post mortem examination will be made, the case diagnosed and a complete report sent to you immediately without charge or obligation to you. You merely pay the transportation on the birds. Our diagnosis department is maintained as a free service to poultrymen everywhere.

Range Paralysis

QUESTION: Three weeks ago I sent a pullet and received a report that the trouble was range paralysis, but the cause of the disease was not mentioned. I have a pullet with range paralysis and would be pleased to express it to you if you would care to put this fowl through your clinic.

Answer: At the present time we recognize three possible causes of range paralysis. At least we find three separate conditions, sometimes alone and sometimes mixed together in flocks affected with paralysis. In some cases the trouble seems to be due to chronic coccidiosis and treatment for coccidiosis using either Phen-O-Sal or Rakos gives quite satisfactory results. In other cases various worms, particularly the very small microscopic tapeworms or capillaria worms, are involved. Proper treatment for these conditions, using Avi-Tabs over a period of ten or fifteen days gives very good results. A third cause seems to be a virus affecting the nerves. In such cases the nerves leading to the legs and wings and other parts of the body are greatly enlarged. For this condition we have no specific treatment to offer.

On a general recommendation we urge that such flocks be culled out and hopeless ones removed and the balance put on a tonic treatment of Avi-Tabs hoping thereby to restore their resistance. There seems to be an immunity developed from the virus type of paralysis. Therefore, if the health, vitality and resistance can be maintained the birds may pass through an attack and be more valuable thereafter than they were before.

From this discussion you will note that we emphasize correct diagnosis for best results in treatment. For instance, if a flock affected with chronic coccidiosis is treated for worms, the results will not be satisfactory and so on with the other conditions. Finding the cause and treating it specifically is the best assurance of success. By attending Dr. Salsbury's school you will learn how to correctly diagnose the various poultry ailments so that you can prescribe the correct treatment.

Chronic Colds

QUESTION: I am sending three pullets for your free laboratory diagnosis. Our flock looked beautiful until about three or four weeks ago when I noticed some of them becoming pale with ruffled feathers. They were thin although they were well cared for and were full of feed. I posted a few and found tapeworms. Then I wormed the flock with Kamala Caps and also used Phen-O-Sal. Although I haven't found any tapeworms since, the birds aren't any better. Yesterday I started using Avi-Tab treatment and will continue this until I hear from you. Can Rakos be used in the same mash with Avi-Tabs?

Answer: In one of these birds we found a chronic cold affecting the sinuses and windpipe. The second bird was very thin and had a chronic cold. The third bird had several very small tapeworms and a chronic cold. We would suggest that you vaccinate your birds with a double dose of Mixed Bacterin to check the colds. As Avi-Tabs are more effective in controlling microscopic tapeworms than are the worm caps, we would suggest that you continue using them until the birds have received a ten-day treat-



FOWL POX

.. Easy to PREVENT Difficult to STOP

When hens are in full production and eggs are highest, it's a costly matter to have outbreaks of Fowl Pox, cankers, roup, etc. Yet in every section of the country thousands of poultry raisers lose hens by the hundreds each winter, as a result of this feared disease. Once it gets a start there's little one can do to stop it.

An Easy Disease to Prevent

Fowl Pox is one of the easiest diseases to prevent by vaccination. But to secure the best results chickens should be vaccinated before the pullets start to lay. Use Dr. Salsbury's Fowl Pox Vaccine (chicken strain) for permanent immunity. For birds in production, use the pigeon strain; produces no set-back.

It Doesn't Pay to Take Chances!

Don't take any chances this year! Vaccinate and make sure your flock is safe. Its small cost will more than be returned to you in larger profits.

In testing the value of chicken pox vaccination, a leading experiment station found that flocks not vaccinated averaged 158 eggs per bird, while birds in vaccinated flocks averaged 163 eggs per bird during the year.

Go to your local Dr. Salsbury Poultry Health Service Station and get complete information about vaccinating at once. You will find that he recommends Dr. Salsbury's FOWL POX VACCINE because he knows that it does the work. It is made in our own laboratories under government license No. 195. Fresh, tested stock now ready at new low prices. See your dealer at once.

●● Vaccinate Against BRONCHITIS



We are pleased to announce that Dr. Salsbury's Laboratories are now producing Bronchitis Vaccine. This will enable poultry raisers to prevent Bronchitis and remove another of the many dangers that might rob you of your poultry profits.

Exhaustive tests have been made to prove the strength and reliability of Dr. Salsbury's Bronchitis Vaccine. It is manufactured under Government license in a special unit of our newly equipped laboratory designed for the manufacture of Bronchitis Vaccine, only.

Prices: 100 doses	\$ 3.00
500 doses	12.50
1000 doses	24.00

Dr. Salsbury's

PHEN-O-SAL

The old reliable drinking water medication in tablet form.

PHEN-O-SAL acts as an intestinal antiseptic and helps prevent troubles of the digestive tract. It is recommended for all ordinary bowel disturbances and has been successfully used for coccidiosis by tens of thousands of poultry raisers.

PHEN-O-SAL is easy to use. You simply put the tablets in drinking water or milk where they dissolve instantly. It may be used in any kind of metal containers.

Every time your birds drink they take into their system a medicated fluid which penetrates to the folds of the intestines where the coccidiosis germs are doing their damage.

PHEN-O-SAL should be used during a worm treatment in order to help heal the intestinal inflammation which is always caused by worms.

Dr. Salsbury's

RAKOS

**A NEW LIQUID TREATMENT
FOR
COCCIDIOSIS**

Convenient to use with ground corn or scratch feed. It has been thoroughly tested and users report miraculous results.

RAKOS is very inexpensive to use. A five-day treatment costs only ½c to ¾c per chick, depending on the size container in which it is purchased

It is especially helpful in stamping out chronic coccidiosis.

RAKOS exerts a stimulating action to the digestive tract, aids digestion and increases the appetite. It is a germicide and exerts a powerful antiseptic action.

Use it according to the detailed directions on the label.

ment. Be sure the birds have plenty of roosting space and fresh air at night and that the quarters are very sanitary and free from excess dust in the air. Spray the birds several times a day with Cam-Pho-Sal solution using one teaspoonful in each one-half pint of warm water.—We feel that best results can be obtained by giving the Rakos treatment first and then following with Avi-Tabs treatment in preference to using them both in the same mash.

Small Tapeworms, Chronic Coccidiosis, Soft Bones

QUESTION: I am sending two chickens to post. Have lost five that look like the largest one. I thought they had tapeworms, but posted one and could not find any worms. The liver was covered with small white spots about the size of a pin point. It was firm and dark in color.

Answer: In the two birds which you sent we found a large number of very small tapeworms, several capillaria worms, sometimes called microscopic roundworms, and a chronic form of coccidiosis. The bones were of rather weak structure, very likely due to the run-down condition of the birds. The liver that you described is quite typical of cholera, but we did not find this condition in the birds we examined.

To correct the condition which we found we would suggest that you first treat the birds for coccidiosis using Rakos according to directions. Then give each bird a Kamala Cap to remove the tapeworms. This should be followed with a ten-day treatment of Avi-Tone, using two pounds in each one hundred pounds of mash. Avi-Tone will help restore the vitality and increase the appetite. See that the mash the birds receive is well balanced and includes the proper minerals. Also be sure that the birds are not overcrowded in their quarters.

External and Internal Parasites

QUESTION: I hope you will be able to find what is wrong with the two chickens I am sending you. Have lost about 40 in the last five months. Some linger while others die quickly. One of the birds I am sending has a lump under the eye. They don't all have that, but all rattle in the throat.

Answer: Both of the birds you sent were very lousy. The Barred Rock had a large roup eye, a diseased nerve leading to the intestines and numerous capillaria worms in the crop and intestines. The White Wyandotte likewise was infested with numerous capillaria worms and also small tapeworms. There was also some inflammation of the windpipe. We should suggest that you treat these birds for lice, using Nic-Sal according to the directions on the label. Also give the

birds a 15-day Avi-Tab treatment to remove the worms. Use the Avi-Tabs in a moist mash at the rate of one tablet to every five birds as the first morning feed. At the same time the birds should receive six or eight Phen-O-Sal tablets to each gallon of drinking water to heal the bowel inflammation. If numerous colds are prevalent in this flock it may be advisable to vaccinate the birds with 2 c.c. of Mixed Bacterin. Valuable birds may be treated individually by washing the affected parts with Cam-Pho-Sal solution.

Chronic Cholera

QUESTION: The specimens we are sending are from a customer's flock. This customer has treated her birds but is still losing one after another. We wish a diagnosis sent to her and to us.

Answer: The White Rock you sent us showed typical lesions of chronic cholera. This is an infectious disease caused by a specific germ. It seems to be more common in birds that are heavily fed, especially when sanitation is not of the best. To stop the losses you should vaccinate with the Cholera-Typhoid Bacterin, medicate the drinking water by using Phen-O-Sal tablets and then thoroughly clean and disinfect the premises. Also change the feed for a while so that it contains less corn and protein and more bran and oats. These measures usually stop losses quite rapidly and we hope it will do the same in your case.

Virus Type of Paralysis

QUESTION: Please examine the pullet I am sending you by express and report the trouble. Also let us know if there is any chance to cure the sickness. We have been looking for worms and coccidia, but cannot find any. The birds get lame and hang their wings and losses have been heavy.

Answer: The bird you sent showed the virus type of paralysis which affects the nerves and it also had chronic coccidiosis. In treating chronic coccidiosis we would suggest that you use the Rakos treatment. This has been used very successfully for coccidiosis in various stages. While there is no specific treatment for the virus type of paralysis it has been observed that good management and treatment with tonic such as Avi-Tabs and Rakos have helped a good deal to build up the vitality and restore the vigor of the birds. Use the Rakos as suggested above. Then follow with Avi-Tabs in a moist mash at the rate of one tablet to every five birds as a daily treatment for five or six days, or even longer if necessary. Culling out of affected birds, thorough cleaning up and disinfecting of the premises should be practiced on general principles.

Minerals and Vitamins for Poultry *

By G. T. KLEIN

Poultry Husbandry Specialist Kansas State
College, Manhattan, Kansas

The story of minerals and vitamins is the most interesting and fascinating part of poultry nutrition. A German scientist several years ago found that chickens and animals could live a much longer period if they had no food than if they were fed a ration entirely lacking in minerals. These minerals are not only needed for the building of bone and tissue, they are necessary in digestion and the very life process.

The story of the vitamins reads like a novel. They are mysterious in their nature. There is no chemical test for them yet. We know them by their presence or their absence in feed. They are health giving substances and without them life will perish. The chicken's body is 3.5 per cent mineral. Of the dry matter 8.5 per cent is this material and 35.5 per cent of the dry matter of the egg is composed of it. The most important minerals are calcium, phosphorus, sodium and chlorine. Chemical analysis also show potassium, magnesium, iron, copper, and silicon. This long list of chemicals need not give us serious concern for most of them are found in the common feeds that we use in poultry rations.

Calcium needed in bone building and shell formation is abundant in oyster shell and in limestone. There is little

evidence to show that either of these sources of calcium is superior. Oyster shell contains iodine and iodine is a desirable chemical in the poultry ration. If there is an advantage, it is in favor of oyster shell over limestone. These materials can best be self-fed the flock.

Phosphorus is needed in bone building. It is found in bran and alfalfa, but not in sufficient quantities. It must be added to the ration in another form but care is necessary in feeding it. Since it is needed for bone building, the best form in which to add it is the form in which it occurs in bone meal. It is one of the minerals that will cause nutritional disturbances, if over-fed.

Rations for hens or chicks that contain 10 per cent or more meat scraps will contain ample phosphorus for normal growth. The addition of extra bone meal to the ration containing 10 per cent meat scraps is almost certain to cause enlarged joints, slipped tendons, and deformed bones. Chick rations in particular that contain 10 per cent meat scraps are certain to cause trouble if more bone meal is added.

Sodium and chlorine are badly needed by poultry, but fortunately these materials can be added in the form of common salt. It is customary to add 1 per cent salt to poultry rations. This is an adequate quantity but it must

Insure Your Birds Against...

ROUP and COLDS

By Vaccinating Them with

Dr. Salsbury's

MIXED BACTERIN

From 85 to 90% of all roups and colds can be successfully treated with Dr. Salsbury's Mixed Bacterin (Fowl). It is recommended for all infections of colds, roup, and cankerous conditions in which there are pus producing organisms or for colds and roups that are of a bacterial origin.

It is used both as a preventive and as a cure. As a preventive inject 1 c.c. of the bacterin for all those birds not affected, and as a curative 2 c.c.'s of the bacterin for those affected. Repeat the treatment in three to five days if necessary.

Dr. Salsbury's Mixed Bacterin for fowls is properly aged, triple tested and of full strength. It is the most economical bacterin to buy because you get one full c.c. for every dose. When you compare prices be sure to find out if prices quoted are on $\frac{1}{2}$ c.c. doses or on doses of one full c.c.

It is simple and easy to vaccinate. You can do it yourself or you can call on a Dr. Salsbury dealer to help you. Complete instructions come with each package.

Order your supply at once through your local dealer. Vaccinate your flock now and avoid colds and roup later.

*Presented at our short course on Poultry Diseases, July 13, 14, 15, 1934.

A Part of the Dr. Salsbury Organization



The back row consists of a portion of the members of Dr. Salsbury's field staff, while the front row shows the male members of the office staff. All members of the field staff have had special training in the prevention and control of poultry diseases, while the office force includes five licensed veterinarians who constitute the scientific and educational staff. They are all men who rank very high as poultry disease specialists. All of the men shown in the picture and many others put in their full time for the Dr. Salsbury's Laboratories and they are always at your service in helping you solve your poultry disease problems.

Back row, left to right: S. Thornton, Iowa; Garner P. Elliott, South and North Dakota; Geo. Wieman, Iowa; Roy Ballantyne, Iowa;

A. A. Hoberg, Minnesota; A. H. Jeannoutot, Nebraska; A. Unger, Kansas; Geo. Dibble, Minnesota; L. L. Sauer, Kansas; Jack Gresant, Texas; F. J. DeVoe, Indiana; J. W. Hammond, Ohio; A. V. Amet, Missouri; C. M. George, Indiana; Paul Staderman, Illinois; Ned F. Steel, Missouri; Elmer DeVoe, Indiana; F. L. Sickles, Illinois; F. M. Sager, Illinois; John H. Beattie, Michigan; W. H. Hazen, Pennsylvania; J. A. Currey, Ohio.

Front row, left to right: Gerald Skyrme, D. J. Skyrme, A. G. Studier, Dr. O. J. Mayfield, Dr. B. F. Kaupp, H. G. Bos, John Salsbury, Dr. J. E. Salsbury, Dr. S. Eriksen, Dr. R. C. Surface, M. B. Potratz, N. A. Winter, Virgil Helgen.

be thoroughly mixed. Large quantities of salt are extremely toxic to poultry and must be avoided under all conditions.

Mineral mixtures in a ration are not desirable unless the ration contains vegetable protein concentrates instead of meat scraps. If the ration contained such concentrates as soy bean meal as a protein supplement, then it would be necessary to add about 5 pounds of mineral to each 100 pounds of feed. This mineral mixture could be composed of 60 per cent bone meal, 20 per cent ground oyster shell or limestone, and 20 per cent salt.

The vitamins take their names from the letters of the alphabet. There is no chemical test for them yet, their biological affect on animals is plainly evident. Perhaps their action on the body is a combination of chemical and physical reactions.

Vitamin A is associated with the yellow pigment of plants called carotin. This pigment contains properties which when taken into the body of the animal is capable of forming this Vitamin A. The pigment zanthophyll does not carry this property and is not capable of producing Vitamin A.

Lack of Vitamin A causes a nutritional disorder in the fowl, popularly referred to as Nutritional Roup or more technically Avitaminosis A. Since Vitamin A is formed by the feeding of yellow corn, green feed, alfalfa, cod liver oil, and similar feeds, rations that are low in these materials are likely to cause trouble. This deficiency causes the formation of white patches on the lining of the throat, in the kidneys, and the eye.

Practical tests have shown that 40 per cent yellow corn in a ration with no additional green material will prevent this disease. White corn rations with 8 per cent alfalfa leaf meal will give normal growth and development. These determinations are for chickens. The requirements for turkeys are somewhat higher.

Vitamin B is found in the hulls of grain such as bran. While lack of it would cause nervous disorders, it is so abundant in the poultry ration, that we need not give it serious concern. There is little possibility of a ration being deficient in it.

Vitamin C found in orange juice and tomato juice is not required by poultry. They seem to have the ability to manufacture it in their livers.

Vitamin D, known popularly as the sunshine vitamin, is most important in poultry nutrition. This vitamin makes possible the use of mineral in the body, giving eggs of normal shell and bones of proper texture. Lack of it gives the condition comparable to rickets in children.

The theory of Vitamin D is that the ultra-violet rays of the sun falling upon the body causes chemical changes and the formation of the vitamin in the body. We also know that this health giving material may be formed

in the body of fishes and stored in their livers. The use of cod liver oil and sardine oil is well known to poultrymen.

Cheap oils such as cottonseed oil have been treated by exposure to sunshine and ultra violet lamps with the hopes that Vitamin D properties might be imparted to them. These tests have been practically negligible in results. Feeds are being created in the same way, but nothing very practical in poultry feeding has developed from it.

Vitamin E is important in reproduction. It is abundant in wheat germs and poultry rations are not likely to be deficient in it.

The best manner of feeding cod liver oil to a poultry flock is a matter for some discussion. For baby chicks it can be most easily mixed with the mash and at the rate of about 2 per cent. For the laying flock, a popular method is to mix it with other feeds and to feed it as a wet mash. The method that follows is said to be more beneficial in increasing hatchability than any feed that can be fed:

2 pounds dry oats germinated
or soaked

2 pounds condensed buttermilk
or sour milk

$\frac{1}{4}$ pint cod liver oil

This quantity is enough for the daily feeding of 100 hens. It should be started about December 1 and fed throughout the hatching season.

IMMEDIATE VACCINATION FOR BRONCHITIS ADVISED

Poultrymen who have experienced bronchitis in their flocks and who have not yet vaccinated their flocks against bronchitis are urged to do so now by Charles B. Hudson, assistant poultry pathologist for the State Agricultural Experiment Station, Rutgers University. He points out that it is not yet too late to take this precaution.

"When cold weather comes, there may be heavy losses in flocks not protected from bronchitis by vaccination," warns Mr. Hudson. "Not only may a heavy loss occur through mortality, but there may also be distinct reverses for the poultryman through reduced egg production and a lower degree of hatchability.

"The best testimonial for the success of the vaccine and the method of application developed at the Experiment Station lies in the fact that the owners of approximately 35,000 birds vaccinated last year have already vaccinated or signified their intention to do so," he reports.

AVI-TONE PRODUCES STRONG CHICKS

Bridgeton, N. J., May 17, 1934.—My baby chicks are on the prevention program which I have used ever since January. I cannot give it enough praise. I have been hatching eggs in our incubators from flocks that have been on the Avi-Tone. My, what wonderful chicks I get from those eggs.

Another year all of our flock owners will have to use Avi-Tone or we will not take their eggs. That's what I think of Avi-Tone. The people in this territory who are using your program are more than pleased with it.—Mrs. L. H. Halter.

MESSENGER HELPS CHICK CUSTOMERS

Jefferson, S. Dak.—I have given many copies of the MESSENGER to my baby chick customers and they all claim they got more good out of the copy alone than out of a year's subscription to other magazines. It is so well gotten up that any ordinary farmer or his wife can follow it and understand it well.—Mrs. Alvana Bernard.

MANUAL A MASTERPIECE

St. Joseph, Mo.—I consider your new Manual a masterpiece in its line. It is an exceptionally fine piece of work and you are to be congratulated on it.—Prof. L. S. Kleinsmith.

MANUAL IS WONDERFUL

Carrell, Md.—The new Poultry Health Manual is wonderful and ought to be a big help to poultry raisers.—Reindollar Bros. & Co.

DR. SALSBUARY'S FOURTH ANNUAL SHORTCOURSE WELL ATTENDED

Over five hundred dealers and service men from all sections of the country attended Dr. Salsbury's Fourth Annual Short Course which was held in Charles City, Iowa, July 11, 12 and 13.

At this short course these dealers and service men received three days of intensive instruction on various phases of poultry diseases, sanitation and management. Demonstrations were given on vaccination, blood testing, chick sexing, post mortem methods, culling, caponizing, etc.

The idea back of this short course is to give the dealers training of the kind that will enable them to give a more helpful poultry health service to the poultry raisers of their local community.

All dealers who attended the short course received a certificate of attendance, and if you see such a certificate at your local Dr. Salsbury Poultry Health Service Station you will know that the owner or operator of the station took the three-day course and is therefore better qualified to help you with all of your poultry problems.

The fact that he took the time and went to the expense of attending the short course should convince you that he is deeply interested in your success and anxious to give you the kind of service that will prove of real value to you. You can always feel free to consult your local Dr. Salsbury dealer.

DR. SALSBUURY'S MEDICINES FOR POULTRY

Preparations	Size Packages	Price	Uses
AVI-TONE 100% Medicine	2 lb. carton	\$.75	Flock treatment for worms, worm preventive and general tonic. For baby chicks and turkeys, growing stock and laying flocks. In powder form.
	5 lb. carton	1.75	
	15 lb. drum	4.75	
	25 lb. drum	7.50	
	50 lb. drum	14.00	
AVI-TABS	100.....	\$1.00	Wormer and tonic in tablet form. For flock treatment.
	400.....	\$3.00	
	200.....	1.75 1000..... 7.00	
KAMALA NICOTINE COMBINATION WORM CAPS	Adult Size Chick Size		Individual treatment for tape and round and pin worms in chickens, turkeys and other fowls. A properly coated tablet that is easy on the birds.
	50	\$.75 \$.50	
	100	1.35 .90	
	200	2.50 1.75	
	500	5.00 3.50	
	1000	9.00 6.00	
KAMALA CAPS	Prices and sizes same as Kamala Nicotine Combination Worm Caps listed above.		For individual treatment against tapeworms only. Used for chickens, turkeys, ducks and geese.
NICOTINE CAPS	Adult Size Chick Size		For individual treatment of chickens, turkeys, ducks, geese and pigeons against round worms.
	50	\$.50 \$.35	
	10090 .60	
	200	1.75 1.10	
	500	3.50 2.50	
	1000	6.00 4.50	
PHEN-O-SAL PRESCRIPTION TABLETS	50.....	\$.50	Excellent corrective for diarrhea and coccidiosis of chicks, Fowl Typhoid, Fowl Cholera, Enteritis, irritation from worms, blackhead in turkeys, also duck and goose cholera.
	125.....	1.00	
		300..... \$2.00 500..... 3.00 1000..... 5.50	
RAKOS	1 pint bottle	\$1.25	Triple acid, antiseptic and astringent, treatment for coccidiosis in young and old fowls.
	Gallon bottle	6.00	
CAM-PHO-SAL PRESCRIPTION	Small bottle	1.00	For roup, colds, flu, gapes, bronchitis, brooder pneumonia, etc., in fowls of all ages. Pure medicine to be diluted with water.
	Medium bottle	1.50	
	Large bottle	2.50	
STOP-PICK	6 oz. can	.50	A preparation for toe, vent, tail picking, and all forms of cannibalism in poultry.
	16 oz. can	1.00	
PAINT-O-SAL	1/2 pint	.90	Stained dye for painting windows to prevent cannibalism and pickout.
	1 pint	1.50	
	Quart can	2.50	
MITE DEATH DISINFECTANT	Quart can	1.00	To control mites, and disinfect poultry houses. A powerful germ killer and insect destroyer. For treating litter against coccidiosis dilute with distillate.
	Half gallon can	1.50	
	Gallon can	2.50	
NIC-SAL	1/2 pint 75c—1 pint	1.25	A nicotine preparation to paint on the roosts for lice.
	1 quart \$2.00—1 gal.	6.00	
LOUSE POWDER	1 lb. sift top can	.40	Very effective for dusting fowls for lice. May also be used in the nests to keep down vermin.
HOG WORM OIL	Quart can	1.80	To kill round worms in hogs, sheep and poultry. A two ounce all metal syringe for administering oil, \$1.20.
	Half gallon can	3.25	
	Gallon can	6.00	
HATCHERY SPRAY	Quart can	2.75	Effective germicide for spraying eggs and incubators. Not poisonous.
	Half gallon can	4.50	
	Gallon can	8.60	
RAT DEATH	4 oz. can	.50	A Red Squill preparation that kills rats and mice only.
FOWL POX VACCINE Chicken and Pigeon Strains	100 dose pkg. each	1.00	To prevent Chicken Pox by feather follicle or stick method of vaccination.
	500 dose pkg. each	4.00	
INFECTIOUS LARYNGO- TRACHEITIS VACCINE	100 doses	3.00	For permanent immunity against the virus form of bronchitis.
	500 doses	12.50	
	1000 doses	24.00	
MIXED BACTERIN FOWLS	60 doses, 60 c.c.	1.50	A preventive and curative treatment against roup, colds, and related diseases affecting the head of chickens and turkeys. Note that you get one full c.c. per dose.
	120 doses, 2-60 c.c.	2.40	
	250 doses, 250 c.c.	5.00	
	500 doses, 2-250 c.c.	8.00	
	1000 doses, 4-250 c.c.	15.00	
CHOLERA-TYPHOID BACTERIN	60 doses, 60 c.c.	1.50	To vaccinate for Fowl Cholera and Fowl Typhoid in all poultry, both preventive and curative.
	120 doses, 2-60 c.c.	2.40	
	250 doses, 250 c.c.	5.00	
	500 doses, 2-250 c.c.	8.00	
	1000 doses, 4-250 c.c.	15.00	
ANTIGEN	Write for special literature.		Blood or slide test for B.W.D. The Ultra-Rapid Antigen Test.
PULLORIN	Write for special literature.		Wattle method for B.W.D. testing.
TUBERCULIN	40 tests	.75	For T. B. testing. Wattle method.
	200 tests	2.00	
B. W. D. TEST CABINET	Complete equipment		For rapid Antigen test.
SYRINGE Complete with 2 needles.	10 c.c.	2.75	Lifetime Bacterin syringe. Pullorin or Tuberculin testing syringe.
	2 c.c.	3.50	

TESTING TUBES—SYRINGE NEEDLES—DISSECTING SETS—OTHER EQUIPMENT—Cod Liver Oil—Write for quotations. Garget—Special Bacterin for Garget. Write for special literature. Blood tests for abortion—15 cents each.

DR. SALSBUURY'S LABORATORIES

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CHARLES CITY
IOWA

for



Worm Your Flock Now For More Poultry Profits

... A Worm Infested Flock Will Never Make Any Money for You

Hundreds of local poultry raisers have found that it pays to worm their birds. They have less trouble with their flocks and they make more money in greater egg production.

This job of worming is so important, however, that it will pay you to give serious consideration to the kind of worm preparations you use. Before you do your worming, come in and have a talk with us. We have made it our business to learn about the best ways to combat the worm problem. We have free literature and information available and will be glad to help you select the type of worm preparation that will do the best job for you.

We recommend Dr. Salsbury's line of Caps because it offers you the choice of the various kinds of treatments to meet your particular worming need. We have found these caps to be highly satisfactory.



Dr. Salsbury's
POULTRY HEALTH
SERVICE STATION

Stop in and have a talk with us. There may be other poultry troubles that you want to discuss and we should be glad to help you. Make this your headquarters for poultry information.