

NUTRITION

Antibiotics for Poultry and Pigs

Once costly curiosities, the antibiotics are now being fed to chickens, turkeys and pigs. Result: They grow faster, reach market age sooner, and consume less food.

By J. D. RATCLIFF

► LESS THAN a decade ago penicillin was a costly curiosity, often unobtainable even when a life was at stake. Today it is so cheap and plentiful that wise farmers are feeding it to pigs, turkeys, and chickens—with eye-opening results. Penicillin, aureomycin, terramycin, bacitracin and other antibiotics somehow prod animals to grow faster. They reach market size sooner and consume less food. Result: more meat for the world's dinner table—and budget relief for harried housewives.

The spectacular growth-promoting powers of antibiotics will inevitably rank as an all-time great discovery in animal nutrition. As little as \$1.60 worth of drug per \$100 worth of feed will hasten pig growth as much as 30%, turkeys 20%, and chickens 10%. Since animals mature earlier under this regimen, they require less grain to produce a pound of meat. On top of this, the miracle drugs minimize many animal diseases that cost farmers millions of dollars a year.

The discovery came more or less by accident. For years, farmers have known that pigs, chickens and turkeys do not thrive on an all-grain diet. They must have a supplement of animal proteins—skim milk, fish meal or meat scraps. Until 1948 no one knew what the essential "animal protein factor" was. Then it was identified as vitamin B12.

Crudely extracted from broths that had been used to produce antibiotics and fed to chicks and other animals, it gave growth a mighty kick forward. Three or four weeks after hatching, chicks might weigh 45% more than the usual average.

Research men assumed it was the vitamin that did the job. Then a group at Lederle Laboratories fed chicks pure B12—and they grew no faster than normal. It was obvious that something else in the crude extract was performing the growth miracle. In time, it turned out to be an antibiotic left behind after the drug for human use had been extracted.

Virtually every state agricultural experiment station in the country grasped at this promising lead. Dr. Damon Catron, of Iowa State College, reported that pigs fed

aureomycin grew 15% to 31% faster than usual. Dr. James McGinnis, of the State College of Washington, found that at the end of 84 days pigs on antibiotic feed weighed 94 pounds, whereas others weighed only 67. A Missouri farmer noted that his hogs were ready for market in six months instead of seven or eight. Further, antibiotics made runt pigs grow to normal—important since the average litter contains at least one runt.

Antibiotics Save Feed

Careful studies showed that antibiotics would save 30 to 50 pounds of feed per 100 pounds of pork produced. Projected to the entire pig population (nearly 100 million animals), this indicates a potential annual saving of about two million tons of feed—worth about \$200 million at current prices.

Dr. Catron summarized the impact of antibiotics: "For the swine producer it will mean faster and more efficient production. This will be reflected in cheaper pork chops and bacon for the consumer."

Antibiotics hold equally great promise for poultrymen. It takes 11 to 12 weeks to get a three-pound broiler ready for market. Antibiotics have cut this to as little as nine weeks. The drugs have hastened egg production by as much as 15 days. Further, antibiotic feeds cut death rates. Approximately 20% of all chicks hatched die before reaching market or laying age. Experiments

A CONCISE HISTORY OF ASTRONOMY

by Peter Doig, F.R.A.S.

A new volume which provides a comprehensive and concise account of the development of Astronomy from earliest times to the present.

No general history of this kind has appeared in English for forty years, a period of great progress. Revolutionary discoveries during this period have in many cases reversed previous ideas on the subject.

From the Table of Contents—

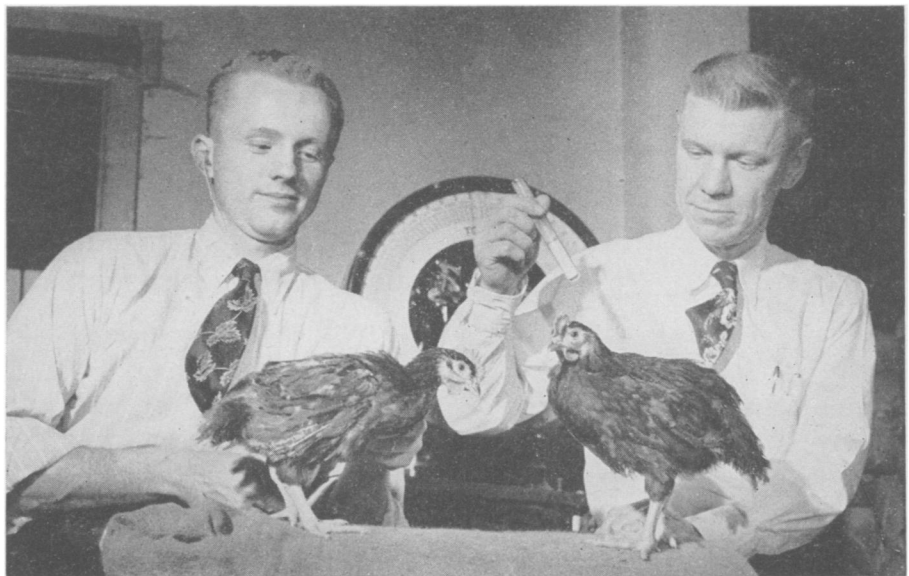
The Oldest Astronomy — China — Egypt — Mesopotamia — India — Greece — Mohammedans — Tartars — Medieval Europe — Copernicus — Tycho Brahe — Kepler — Galileo until Newton — The Eighteenth Century — William Herschel — Nineteenth Century — Twentieth Century. \$4.75

Expedite Shipment by prepayment

PHILOSOPHICAL LIBRARY

Publishers

15 East 40 St., Desk 35
New York 16, N. Y.



AUREOMYCIN FED—Dr. Robert J. Lillie, left, poultry husbandry, and Dr. H. R. Bird, in charge of poultry investigation, U. S. Department of Agriculture Experiment Station, Beltsville, compare two hens. The one on the left ate a normal diet while the sleek fat hen on the right had aureomycin added to her feed, giving her a one-quarter pound weight advantage. Dr. Bird's test tube shows amount of aureomycin—10 grams—added per ton of feed to make this difference.

conducted by Charles Pfizer & Company, makers of terramycin, indicate this death rate can be cut in half.

Turkeys Also Responsive

Turkeys, particularly sensitive to disease, are similarly responsive in hardiness and growth to antibiotic feeds. In a number of experiments deaths have been cut to 40% of normal.

Antibiotics will not make a chicken or pig grow abnormally large. They merely cut the time required to reach full growth—with a consequent saving of food and labor.

How do the antibiotics achieve their remarkable effect? There are a number of theories, none of them proved. They may kill off intestinal bacteria which compete for food; or destroy bacteria which produce growth-slowing toxins; or contain some unidentified nutrient.

Will the drugs stimulate growth of cows, sheep and goats? It is too early to say, since this work is only a few months old. But the answer will likely be no. These animals have pouch-like rumens, or stomachs, in which bacteria act on foods to produce essential vitamins. Antibiotics might kill off these valuable microbes—doing more harm than good.

Preliminary evidence indicates the antibiotics will be useful elsewhere in the animal world. They have hastened growth of the white rats used by medical experimenters. They appear to produce sturdier and healthier pups, and have even been used with good results in fish hatcheries. For reasons as yet unexplained, they seem to produce mink larger than normal; in one experiment they increased the size of pelts 20%.

Affect Other Animals

Almost as soon as the first experimental results were announced, commercial feed mixers started using antibiotics. Drug makers who had once measured antibiotics on chemists' balances started selling crude extracts by the boxcar, and now foresee an expanding market worth millions of dollars a year. Most of the antibiotics for this market are derived from broths that once went down sewers. After a certain point it is no longer economical to extract drugs for human use, but the spent broths contain enough antibiotic to stimulate animal growth.

Will antibiotics added to milk or cereal promote healthy growth of infants and young children? As yet, no one knows. But experiments to determine the effect are under way—experiments which will take several years to complete. For the present, antibiotics are significant enough for the new job they are beginning to do on a grand scale—assuring more meat at a lower cost at a time when skyrocketing prices are a matter of national concern.

This article was prepared for SCIENCE NEWS LETTER in cooperation with the READER'S DIGEST. It will appear shortly in that magazine.

Science News Letter, May 5, 1951

CHEMISTRY

Synthetic Steroid Chemical

➤ A CHEMICAL achievement which promises to aid the fight against cancer or heart disease or arthritis has been made by Prof. Robert B. Woodward and associates of Harvard University.

"The first total synthesis of a complete steroid" chemical is their accomplishment.

Steroids are a group of chemicals that include sex hormones, cortisone, bile acids which are the starting material for cortisone, some cancer-causing substances and the non-starch part of some plant chemicals such as the heart medicine, digitalis.

The chemical Prof. Woodward has made in his laboratory is not cortisone. It is not the related anti-arthritis chemical, compound F. Opinions are divided on whether it can be used as the starting point for synthesizing compound F or cortisone through a process by-passing the bile acids.

The practical value of the new synthetic chemical remains for the future to tell. It was pointed out, however, that the processes for converting one steroid chemical into another are so well worked out that the synthesis of natural steroids may be accomplished in the near future. Natural steroids are the ones found in plants and produced by certain glands such as the adrenal glands that produce cortisone.

Cortisone synthesis in the laboratory or manufacturing plant starts with another animal product, bile acids. Prof. Woodward's synthesis of a steroid starts with a simple coal tar derivative, orthotoluidine.

Working with Prof. Woodward at the completion of the synthesis were: Dr. Franz Sondheimer, Dr. David Taub, Dr. Karl Heusler, Dr. W. M. McLamore, Mrs.

Dorothy Voitle and Mr. Irving Osvar. Financial support was given by Merck and Company, manufacturers of cortisone, and Research Corporation of New York.

Science News Letter, May 5, 1951

MEDICINE

Cortisone Helps Delay Liver Degeneration Due to Diet

➤ CORTISONE CAN help delay liver degeneration due to faulty diet, Dr. Klaus Schwarz, special research fellow of the U. S. Public Health Service, has discovered.

Dr. Schwarz's studies were made on rats who got their starch and sugar chemistry upset by feeding them a diet that was almost one-third yeast. This caused severe damage to their livers.

The liver damage was very like that seen in humans suffering from the almost always fatal disease, acute yellow atrophy of the liver. This suggests that cortisone might help human patients with this particular liver disease. Dr. Schwarz has not yet been able to make trials of this. European scientists, however, have used another hormone from the adrenal glands which produce cortisone to treat epidemic hepatitis. This is the liver disease that is believed caused by a virus and sometimes called jaundice, because of the yellow skin color it gives. The European doctors claim that the adrenal gland hormone helped in this disease.

Details of Dr. Schwarz's studies are reported in the journal, SCIENCE (April 27).

Science News Letter, May 5, 1951

EXPLORE the SECRETS of the ATOM

with the New GILBERT

ATOMIC ENERGY LAB

\$49.50 complete with all this equipment:

- Geiger Counter*
- Wilson Cloud Chamber
- Spinthariscopes
- Neutron & Proton Spheres
- Electroscopes
- Four Radioactive Ores
- Alpha, Beta, Gamma, Radioisotopes from Oak Ridge
- Gilbert Atomic Energy Instruction Booklet—60 Pages! Illustrated. Nuclear Physics made simple and exciting! Also 2 other books!

● Size of set 25" x 16½" x 5"

* Geiger Counter alone \$19.95

For classroom demonstration
For home experimentation
Instructive—Educational—Safe

The RADIAC Co., Dept. GM-2, 489 FIFTH AVENUE, NEW YORK 17, N. Y.