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FARMSTOCK

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PHOTO-NEWS

The people of Sarybastau are engaged not only in livestock breeding. There is wheat, barley, millet and perennial grass being grown on 6,500 hectares of land, of which 2,500 hectares are irrigated. In 1969, the collective farmers gathered more than 20 centners of grain per hectare. The collective farm fully provided itself with seeds and fodder grain, and sold 40,000 centners of grain to the state.

Here you see autumn ploughing being done on the farm.



Nusupbek Ashimbayev, first collective farmer and then permanent chairman of the farm, decorated with the Order of Lenin, the country's highest decoration for services in developing farm economy.

INCENTIVES

The whole country now faces a new 4-Year Development Plan 1971 — 1974. All sources are whipped into a state of preparedness except the farmer who only listens humbly like a child who is always to be seen and not heard.

But while the child will not be allowed to complain comfort is guaranteed. The same should go to the farmer — this time the comfort will come in the manner of incentives.

Slavish work — hoeing and tilling — is unattractive and unproductive for two reasons. One, it is degrading and two, inefficient. To offset this, simple tools are now available. The farmer may not be able to buy them; the incentive to more production in this context is financial help.

Reaching the market easily and getting needed supplies easily and timely are also very important. In this wise, he needs motorable roads. Surfacing them will be costly now. More and more feeder roads should fan out into the hinterland. It is true farmers have been grouped into cooperatives which should rebuild the bush-paths into motorable ones, nevertheless they have to be activated by some official incentives either in the provision of a road grader or technical assistance.

Simple storage facilities are also very important. At present the farmer is forced to sell off his products shortly after harvest not because he likes it so but because he wants to avoid loss due to pests and weather. But nobody benefits either. When he rushes to the market shortly after harvest, a glut follows, even some of his produce rot while prices fall to the farmer's dislike. Shortly after however scarcity comes in with all its known attendants.

Storage facilities will even out all this inconvenience. The farmer can then spread out his selling. He will produce more and sell evenly. Prices will be stable.

We can go further writing about possibilities. Since we all know these things, why cannot the big man in the big place be pushed into action and relieve ourselves of hunger?

Unfortunately we cannot do otherwise. If the 4-year Development Plan is to succeed we have to eat first; this is why the farmer is an important figure in this bid. He needs INCENTIVES quickly

LETTERS

FOOD FOR ALL

Dear Sir, I appreciate your precision in the editorial of the December '70 issue of the Farmstock.

I wholly agree with your proposal to the Federal Government to follow the exam-

ple of Sierra Leone by purchasing tractors and other agricultural machines en masse for the use of our farmers.

HELPFUL HINTS

Dear Sir,

The article titled "The Salmonella Bacteria" which appeared in the December '70 issue of your magazine was most educative.

I had lost some chickens through one of these diseases. This was due to my ignorance of the nature of the disease and the treatment applicable. Safeguard against further loss has been secured however. I have also cleaned up my poultry farm to avoid the existence and spread of the bacteria.

For personal safety I have adopted more careful methods in my purchase of fish meal which is regarded as one of the sources of the Salmonella disease.

I hope the Editor will feature more of these articles.

Odagbolu

A. Ajibola

Ikeja.

Miss. Subu Adedole.

WAGES REVIEW ARE FARM WORKERS INCLUDED?

Dear Sir,

THE PLIGHT OF FARM WORKERS HAS FEATURED IN THE NOVEMBER AND DECEMBER '70 ISSUES OF THE FARMSTOCK

The Adebó Salaries and Wages Commission has recently secured an Interim Award for workers generally. The inclusion of the farm workers has not been specified in the scheme. They are likely to suffer lower standards of living since prices of goods and foodstuffs are likely to rise.

the scheme and a better treatment than what they are receiving at the moment. It is this lack of high remuneration to farm workers that drives away young school leavers from the farms.

Their case should be looked into as soon as possible to guard against discontent and its attendant evils.

Surulere

S. Banjo

The fact that Nigeria is an agricultural country necessitates their inclusion in

Continue on page

by Leslie J. Elmslie M. A. (Cantab)

Specialising in Agric.

Technical Director, Ejinaka & Thornbers Ltd.

DISEASES OF POULTRY

FOWL POX

FOWL POX IS A VIRUS DISEASE OF POULTRY, WHICH MAINLY AFFECTS CHICKENS, BUT CAN ALSO OCCUR IN TURKEYS, PIGEONS, GUINEA FOWL, AND QUAIL. DUCKS AND GESE ARE NOT AFFECTED, NOR ARE HUMANS NOR ANIMAL. IT IS ONE OF THE OLDEST KNOWN DISEASES AND CAUSES LOSSES IN MOST COUNTRIES.

The most typical symptoms are pox marks on the comb and wattles. These marks start as small grey-white spots, which grow rapidly, and turn yellow. There may be few or many. In severe cases the bird's head may be covered in rough, wart-like growths, which may also be found under the wings, round the vent, or on the legs and feet.

In time the pox marks dry into brown scabs surrounded by red inflamed areas. After a few weeks the scabs drop off, leaving a smooth scar, unless bacteria have entered the site, when the whole is more severe.

AREAS OF INFECTION

In some birds the virus grows in the cells lining the

mouth and throat, causing yellow-white nodules which grow rapidly, and may become thick enough to interfere with eating. Similar growths may come in the sinuses, and interfere with breathing, or in the eyes.

The effect on growth and production depends on the extent of the disease in each bird. In some flocks the disease spreads rapidly, and in others quite slowly. Wounds caused by sharp pieces on the cages or equipment may increase the spread of the disease.

DIAGNOSIS AND PREVENTION

Diagnosis can usually be made by inspection of the birds. Laboratory methods can be used if there is doubt, and include the examination of thin slices of the comb to look for "inclusion bodies" which are typical of Fowl Pox.

Another method is to apply diseased material to the comb of a susceptible bird to see if it gets the typical pox.

There is no cure for Fowl Pox. Good husbandry will generally reduce the effects of the disease, otherwise it must run its course.

Prevention is by vaccination. A live virus vaccine is used, and is applied to the wing web by jabbing it with a two pronged needle which has been dipped in suspension of the virus.

Because the virus is spread by such an unnatural route as the wing web it does not produce the di-

sease, but does produce an immunity, which should last for the life of the bird.

WHEN TO VACCINATE

The vaccination is best made between six and twelve weeks for best results. If it is used before six weeks the bird's immunological system is not fully developed, and so the immunity produced is weaker.

By twelve weeks the birds ought to be protected. However these are not rigid limits. For example the vet may advise vaccination earlier than six weeks if he considers the risk of early infection great.

Again the time may be planned to fit in with other vaccination.

Fowl Pox virus is exceptionally long lived outside the bird. A survival period of twelve months has been quoted in some conditions. There are related Pox viruses, which take their name from the bird most commonly affected by them: Fowl Pox, Turkey Pigeon Pox, and Canary Pox.

Each virus can infect each species of bird, but more mildly than its own kind. An attack of one virus will give the bird partial immunity against attack by the other kinds.

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WANT TO RAISE BROILERS ?

THEN NOTE THESE POINTS

STRAIGHT-RUN CHICKS ARE GENERALLY USED FOR RAISING BROILERS. GROWTH RATE AND FEED CONVERSION DO NOT SEEM TO BE MATERIALLY DIFFERENT IF THE SEXES RUN TOGETHER OR SEPARATELY. COCKERELS GROW MORE RAPIDLY AND CONVERT THEIR FEED MORE EFFICIENTLY THAN PULLETS AND ARE MORE PROFITABLE TO RAISE.

Being heavier at a given age, there is more weight over which to spread chick and contract fixed costs. Very little convincing data are available that the advantages of separating the sexes, if any, offset the costs involved.

Since the demand has been for only white-feathered broilers, there has been very little interest in the sex-linked crosses, which facilitate separating the sexes at

by
Our poultry
Correspondent
hatching time.

BREEDING METHODS

The science of genetics has been and is being continuously utilized to improve broiler breeding stock. Hybrid vigour is obtained by systematic matings that may involve crossing of different

strains of the same breed, or the crossing of inbred lines.

In addition to hybrid vigour, improvement in economic factors often results from these crosses provided the mating includes stocks having superior qualities of genetic origin.

The end product — our modern white, yellow-shanked broiler — is often obtained by crossing the male lines from specialized breeders with female lines produced likewise by specialists.

Each line may be the result of crossing two or more strains. The male lines usually have dominant white feathers and are selected for rapid growth; meat characteristics, such as breast width, body depth, live market grade, and dressing yield; and rapid feathering.

The female line also must have outstanding growth rate, high hatchability, and good, but not outstanding, production of eggs of desirable size and texture. Considerable attention has been given recently to additional factors, such as free-

dom from *Mycoplasma gallisepticum*, feed efficiency, skin texture, skin and slip pigmentation, and, in case of large broiler roasters, and capons, feathering on the breast, absence of breast blisters.

If male and female lines are produced by different breeders, as they often are, each line must, to remain competitive, cross well with other lines. Progeny testing and family selection have been effective in the development of broiler lines.

The buyer must judge the ability of male and female lines to cross well; whether the lines are developed by separate breeders or the same breeder.

The selection of a commercial broiler stock can be the determining factor between profit and loss. Extension poultry specialists and county agricultural agents can provide information that will be helpful in making the selection.

The results obtained by other growers in the area

Continue on page 11



EVERYTHING FOR POULTRY

DAY OLD CHICKS, TURKEYS, LAYERS AND BROILERS IMPORTED EVERY WEEK BY AIR-METAL CAGES, FEEDERS, BRIDGERS, INCUBATORS ACCESSORIES, DRIERS, HAMMERMILL FEEDMIXERS AND SILOS.

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KANO KADUNA PORT HARCOURT

ADVERTISEMENT

WORM INFESTATION IN POULTRY

DO YOU ALWAYS REALIZE THAT WORMS CONSTITUTE A BIG THREAT TO YOUR PROFIT MARGIN FROM POULTRY AND PIGS? HERE ARE SEVERAL WAYS IN WHICH WORMS (ASCARIDS) ADVERSELY AFFECT YOUR ANIMALS AND THEREBY DRAIN AWAY YOUR MONEY.

1. Reduced vitality and increased susceptibility to diseases like pneumonia, gastritis, and anaemia.
2. Intestinal upsets such as diarrhoea or even blockage of the intestinal track by worms when present in large numbers.
3. Loss of egg production in poultry.
4. Reduced growth rate, your poultry take a longer time to reach profitable point of lay.
5. Increased mortality from worms and diseases which are aggravated by them.

You all know that when animals are healthy, they are able to withstand diseases more than when they are weak. At certain stages of the worms' life, they feed from the blood of the hosts (birds) while at other stages, they live directly on the food which their hosts have eaten.

Different stages of growth of worms are found in different parts of the animal's body - in the liver, heart, lungs and finally adults and eggs in the intestine. In all these body organs, the worms can cause severe damage. The havoc which worms have been causing in your poultry and pigs is now very clear.

These symptoms will help you to suspect that your poultry is infested by worms: Growth retardation, pneumonia, gastritis, anaemia, reduced egg production, loss of vitality, increase mortality.

CLEAR WORMS WITH GLOBE PIPERAZINE WORMER:

By using Pfizer Globe Piperazine Wormer, you can avoid the problems enumerated above. Here is how to make the wormer work:

(a) POULTRY: 4 - 6 WEEKS

Use 2 table spoons (1 fluid ounce) per 2 gallons of drinking water for one day.

ABOVE 6 WEEKS: Use 4 table spoons (2 fluid ounces) per 3 to 4 gallons of drinking water.

Repeat the following day.

(b) PIGS AND HORSES:

Use 2 table spoons per 100 lbs. body weight as a drench or mixed into palatable feed. Dose pigs just before weaning or 4 weeks prior to farrowing.

N. B. Do not give any feed or water until the medicated ones have been consumed. Repeat the above dosage one month later in order to clear out the worms completely.

Also, remove litter after deworming so as to avoid an reinfection. And because deworming imposes a stress on your animal, give TERAMMYCIN (Oxytetracycline hydrochloride) Soluble Powder for at least 2 days before deworming, and continue for a minimum of 3 days after this operation in order to overcome the stress.



NEWS AGRIC SHOWS IN GUSAU AND YABO

CAMPING AT MINNA

A 3-day camping was held by the Young Farmers Clubs at Minna recently.

Over 100 delegates from far and near attended the camping. The top officers of the Farmers Clubs also graced the occasion.

Discussions on various agricultural topics were held. Lectures were given by some of the officers on the need for mutual understanding among the various farmers Clubs.

The annual Agricultural shows in Sokoto Emirate were held recently at Gusau and Yabo respectively.

Many eminent personalities and local government officials attended the shows. The shows drew a large crowd from all walks of life, who expressed their satisfaction at the exhibitions.

Many farm products were displayed. Some livestock products were also on show. The presence of officers giving useful hints to attendants at the show added to the success of the show.

Would-be investors in various livestock products benefited a lot from the shows.

LETTERS *Continued from p. 4*

AN EGG IS AN EGG

Dear Sir,

I wish the Editor would put me through as regards the qualities obtainable from eggs produced by local hens through mating and those produced by poultry hens. I wish same provided as regards local hens and poultry hens when consumed.

My village neighbours generally regard the poultry hens as under-nourished and the eggs as tasteless. My own opinion is the contrary however.

I shall be most grateful if these points are clarified in your next issue of the Farmstock.

Idoani Wasiu Hakeem

Editor's Note :

The nutritional value and taste of an egg is the same whether it is obtained from a local hen or the scientifically raised. The mating only adds the sperm which is the male part responsible for the chick-to-be.

HORTICULTURE

— GARDENER

The art of growing and raising vegetables has been as old as the hills. In times past, every household raised its own vegetables. Since choice differs, the family needs different types at least for occasional changes, it is not uncommon to see various types of vegetables vying for dear space and sunlight on a small piece of land. As the village population is usually limited, so too is local demand.

Even many a villager cares less about growing his need since his family can always get fresh, large-leaved vegetables from the refuse-heap.

A general saying has it that vegetables from the refuse, dust or dung heap are usually tastier than those from the backyard. What say you to this please?

SPECIALISATION

With the growth of towns and workers' settlements it has become necessary for a class of farmers to specialize in the production of vegetables to serve the high demand. This speciality is termed HORTICULTURE since the plots are usually in garden form. Because the business is usually located near and timed for markets it is often termed market-gardening.

Though horticulture is an aspect of farming, it is the one with the least training period i. e. 3-4 days. A few hints sets you on the way to success as you watch your vegetables take shape just as your instructors had said.

Vegetables are as many as the quantity of sands in granny's palm but the commonest species are Tete (Spinach) Igbo, Soko and Ita (Okro). A good Euro-

pean population within your reach may justify the inclusion of cabbage, cauliflower and cucumber but unless you are sure of your market, restrict yourself to the common vegetables.

SPACE

If one is lucky to have plenty of space, one can plant many varieties. The plot may be divided into beds of 6 or 8 ft by 25 ft each and the seeds planted in rows. Don't sprout anyhow please. This arrangement allows for weeding and harvesting later. The tubers are ready for market anytime from 2 months depending upon treatment and soil.

Vegetables are very important food items to both human and animals. They contain iron and other trace minerals. These are good for bones and blood. The two determinants of health hence the doctor's or nutritionist's advice to the convalescent and mother eat plenty of vegetables.

With water and good soil, your garden can have a good crop of vegetables for the market. The size of the farm (garden) determines the market.

But you must be picking the vegetables regularly because they are not all likely to be

Continue on p.

PUTTING ANIMALS ON

"THE PILL"

FAMILY PLANNING IS BY NO MEANS CONFINED TO HUMAN BEINGS THESE DAYS. IN BRITAIN VARIOUS FORMS OF "FAMILY PLANNING" OR BREEDING CONTROL OF ANIMALS ARE WIDELY PRACTISED, EITHER FOR ANIMAL WELFARE OR ECONOMIC REASONS - OFTEN FOR BOTH.

The most recent form is the introduction of an oral contraceptive for dogs - a birth pill which has many advantages. It is the first satisfactory oral method of birth control found for animals, and as there are some 4,000,000 dogs in Britain it has enormous potential.

Unwanted Puppies

Perhaps its most important function will be to prevent the birth of many thousands of unwanted puppies - the result of unplanned mating - that are destroyed every year soon after they are born.

The pill suppresses "heat" and the often distressing and inconvenient problem it brings. It also prevents conception should mating occur.

Giving the course of treatment to a bitch enables the owner to control her breeding and to space her litters. A longer course will postpone "heat" to avoid interference with holidays, travel or dog shows.

As the pill has a yeast base it is readily eaten, and tests on 250 bitches before it was marketed confirmed that it had no serious side effects. However, correct dosage and administration are vital, and because of this the pill is available in Britain only through veterinary surgeons.

by
Peter Bullen
*Agric Correspondent of
"THE DAILY MAIL"
London.*

For countries which have a large sheep population, particularly if artificial insemination is being used, the ability to control the breeding pattern of ewes could be very beneficial.

Apart from the value of condensing mating and lambing times and making the breeding pattern more predictable, the method has another advantage in countries where sheep are reared for meat. It enables the breeding season to be brought forward by several weeks so that the lamb crop arrives before the traditional time.

As early-season lamb prices are generally the highest it could pay some flock owners to be first to market with their lambs. Of course, if everyone switches to early marketing the advantage rapidly disappears.

More Rams Needed

Results with sheep have been inconsistent in Britain, probably because of the large number of different breeds - there are more than 40; but there would not be such a drawback in countries where there are fewer breeds.

The technique of controlling or synchronising oestrus or "heat" in ewes also makes it necessary to have one ram for every ten to 20 ewes.



Ovarid, Glaxo's new contraceptive pill for dogs, being administered to an Alsatian bitch.

Sponge Pessary For Sheep

On farms, synthetic hormones to control breeding in sheep have been used for two years. A device was first marketed in April 1967 after tests on 5,000 ewes from 18 different breeds had shown that "family planning" could make a valuable contribution to sheep rearing in some conditions.

The device is a small sponge pessary, impregnated with the hormone, which is placed inside the ewe's genital tract and enables the shepherd to plan the breeding of the flock with precision.

All the ewes can be persuaded to mate and eventually to lamb at the same time, so that lambing lasts for a few days instead of straggling on for weeks.

Continue on page 20

panorABIC

INTRODUCTION

SODIUM AND CHLORINE ARE NUTRITIONAL ELEMENTS THAT FULFILL ESSENTIAL PHYSIOLOGICAL NEEDS OF POULTRY. EXCESS AS WELL AS LACK OF THESE ELEMENTS IS HARMFUL JUST AS WITH OTHER REQUIRED NUTRITIONAL INGREDIENTS. D. G. BRITZMAN (1968) SUMMARIZED THE LITERATURE ON THE EFFECTS OF EXCESSES AND DEFICIENCIES OF NaCl FOR POULTRY.

Results of excess NaCl are:

- Lowered feed consumption
- Lowered rate of egg-laying
- Increased water consumption.
- Increased moisture excretion - wet droppings
- Edema - especially in chicks
- Stress on internal organs - especially on kidneys.

P. Mongin (1968) in his review on the role of acid-base balance in the physiology of egg shell formation, stresses the development of metabolic acidosis resulting from excess Chlorine (Cl⁻ ions) and its inhibitory effect on deposition of Calcium in the uterus during egg-shell formation.

Conversely, added Sodium (Na⁺ ions) increases shell strength if the amount of ingested Chlorine is restricted. This is due to induced mild metabolic alkalosis which has a positive affect on Calcium deposition in the uterus - hence on egg shell strength and quality.

In Israel nearly all layers, replacement pullets, Leghorn breeders, and most broilers are kept in cages in rural areas, and in close proximity to living quarters. Wet

droppings and wet litter are nuisance due to:

- Unpleasant odours generated
- Breeding of numerous flies
- Difficult disposal of manure
- Worse still are the problems of poultry sanitation, prevention and control of disease.

Excess moisture results from excess water consumption. We found that birds in the summer heat drink not double the amount of water as of feed but four times as much and more. Turkeys were consuming 6 to 7 times the amount of water as of feed.

The quantity of water consumed and excreted is a function of the mineral intake contributed by both feed and drinking water.

In checking the predominant minerals Sodium (Na), Potassium (K), Chlorine (Cl) which might possibly be in excess, we discovered that in our normal feed formulations Chlorine is in preponderant excess as well as in imbalance with Sodium. (See tables 1 - 2).

To this excess in the feed should also be added the Chlorine level in the drinking water. The Chlorine level in the water rises sharply in the summer months and in many areas reaches to over 500 p.p.m. while the Sodium level hardly changes - about 100 p.p.m. That Chlorine is consumed in great excess becomes quite clear. (See tables 3-4) (pp. 13 & 14)

The recommended allowance for Chlorine ranges from a maximum of 0.15% in the feed (see M. L. Scott's) to the much lower 0.06% Chlorine recommended by the Agricultural Research Council 1963 - London. The Sodium requirements recommended vary but little - from 0.11% to 0.15%.

ABIC is an Israeli pharmaceutical Company which has made available to FARMSTOCK a number of topical features on additives, concentrates and veterinary medicines.

discusses:

EXCESS CHLORINE IN POULTRY FEEDS — REPLACEMENT OF SODIUM CHLORIDE IMPROVEMENT OF SODIUM : CHLORINE RATIO

what are the effects of excess of chlorine?

A. The bird receiving excess Chlorine must call upon its metabolic reserves in order to remove the excess from its body. This is accomplished via the renal system — the kidneys — and entails the excretion of a greater quantity of liquid with a resultant larger intake of water. In practice this means wetter droppings.

B. The higher concentration of chlorides in the body is an important factor in the acid-base balance of body fluids. The buffering of acidosis in intercellular fluids is accomplished mainly by bicarbonate (HCO_3^-), phosphate and plasma-protein. Of these the bicarbonate is quantitatively the most significant.

Work done mainly in France indicates a positive relationship between the concentration of Cl^- ions

(Chloride) and bicarbonate in the blood i. e. excess Chloride lowers the bicarbonate level and thus lowers the ability to neutralize acidosis.

This creates a certain internal stress and the body must recruit its other metabolic mechanisms to prevent excess lowering of the pH of body fluids.

This is especially significant for layers since the resultant lower level of bicarbonate ($\text{HC}3^-$) in the blood adversely affects the deposition of Calcium in the uterus and thus a weaker egg-shell (See Mongin 1968).

From the above discussion it follows that excess Chloride should be prevented. This can be accomplished by removing part or all of the

table salt (NaCl) and adding other sodium salts that would not contribute to the Chlorine content while effectively supplying Sodium.

The use of sodium sulfate was not feasible since the sulfate ions are diarrhetic and would defeat the intended purpose. The use of sodium citrates, sodium bicarbonate was possible. However, these salts are very basic and if incorporated into the vitamin premix or the finished feed would be deleterious to the vitamin content.

We found that the different sodium phosphates in appropriate combination at a neutral pH were most appropriate. They are excellent buffers and their presence in the vitamin premix even improves the

stability of these fine ingredients.

In addition, the use of sodium phosphates gives us added important advantages:

- They are more economical since they supply not only Sodium but also Phosphorus — (see table 6).
- They supply nutritionally highly available phosphorus (P).

To test the actual effect on the birds of the removal of part of the excess Chlorine from the ration without changing the Sodium level through the addition of sodium phosphates — a number of trials were carried out at the Abic Experiment Farm.

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FARMERS NEED

IMPROVED FARM PRACTICES, ACCESS TO MARKETS FOR FARM PRODUCTS AND THE AVAILABILITY OF SUPPLIES AND EQUIPMENT — THESE PROVIDE OPPORTUNITIES FOR FARMERS TO INCREASE PRODUCTION, BUT WILL THEY USE THEM ?

Here we must go back to the nature of the farmer. He is a person managing a business. As a person he wants his family to be well cared for and he wants a respected place for himself and his family in the community.

Being a farmer, he must seek to reach these goals through his farming.

At early stages of the commercialization of agriculture he is interested first in seeing that his family has enough to eat, and wants to guarantee this by producing it at home.

To meet the other needs of his family, he wants to sell enough products that he can pay his taxes or his rent, meet payments on his debts, if any, and buy necessities that he cannot produce for the family.

As additional goods and services become available in his locality he wants to obtain some of these for his family: education for his children, medical services, and articles such as bicycles, better

clothing, radios, better household furnishings and special kinds of food.

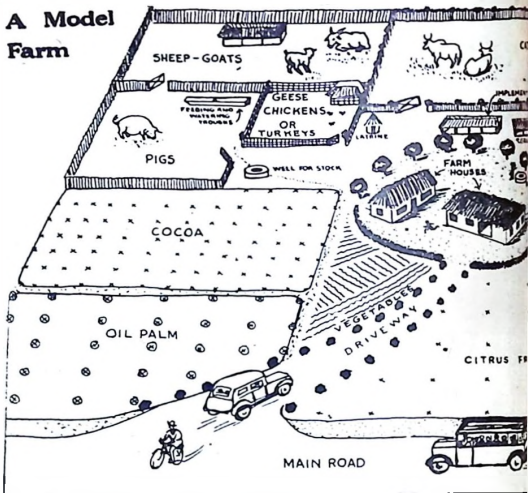
To accomplish these aims through his farm business he must pay close attention to costs and returns. He must sell products worth more in the market than it costs him

farmers to increase their production are primarily economic to farmers.

1. remunerative price relationships
2. a reasonable share of the harvest
3. the availability of

There are other things besides economic ones farmers want respect and recognition from their neighbours. We shall come back to this at the end of the chapter.

A Model Farm



A modern farm, this arrangement can be rearranged according to the needs of the farmer.

to produce them. The margin between costs and returns, the farmer's net income, must keep increasing if he is to be able to give his family a rising level of living.

Thus, the incentives that can be effective in getting

goods and services that farmers would like to be able to purchase for themselves and their families.

All of these, together in combination, provide the

But the most important incentives are economic. We shall discuss them first.

REMUNERATIVE RELATIONSHIPS

To the extent that the farmer produces for the market

C DEVELOPMENT (5)

(PART 1)

D INCENTIVES

by

Our Farming Correspondent

incentive to increase production depends on the relationship between the price he will receive for his product and the costs of producing it. These costs of production are influenced by the price he must pay for purchase inputs.

Prices for farm products,

available, the higher the price offered to farmers for a particular farm product, the more of it they will produce and bring to the market. Many people do not believe this, and government policies often are based on the assumption that it is not so.

Where evidence is cited to

farm products is not the only essential for development but it is an important one.

A recent series of studies in the State of Punjab in India revealed that farmers there shift from producing one crop to producing another in response to price changes to at least the same degree as do the highly commercial farmers of the United States.

Similarly, there is increasing evidence that farmers seek to increase the production per acre of a particular crop when the price of that crop rises, particularly by purchasing increasing amounts of fertilizer for use on the crop.

In Indonesia, where prices of farm products had been held down, controls were abandoned in 1964 and prices allowed to seek their own level. Farm prices shot up. Farmers became more interested in fertilizers and improved seed.

Land was farmed more intensively and larger amounts of rice, corn, vegetables, and other cash crops came on the market.

Farmers do respond to market prices, and if a country wants agricultural development the prices offered to individual farmers must be favourable.

The dependability of prices for farm products is as important as their level.

prices fluctuate widely within each year, with prices usually lowest just after harvest time. Most farmers do not have facilities for storing their crops without losses due to insects or spoilage.

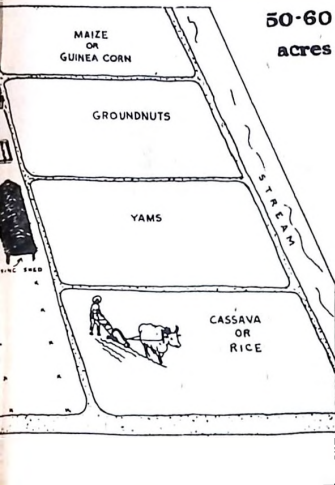
Also, they are usually short of cash and need to sell as soon as they can. Hence, many farm operators feel compelled to sell their products immediately after harvest and this is one reason why prices are lowest at that time.

Prices of farm products fluctuate also from year to year, depending on how big the harvest may have been in the previous year, on what carry-over stocks are on hand, and on the prospects for the harvest in the current year.

Unfortunately, fluctuations in agricultural product prices are likely to be particularly great just at that stage in agricultural development when farmers need to begin to sell more and more of the products of their farms.

Where most of the population is still on farms, so that the domestic off-farm demand for farm products is still relatively small, modest increases in production can have large effects in pushing market prices down.

Furthermore, marketing facilities needed for transporting, storing, processing, and other handling of the increased supplies usually are slow in developing. This tends to



the area and type of land available.

Both the level and the dependability of prices for farm products influence the degree to which they provide incentives to farmers to increase production.

When other essentials for agricultural development are

prove that prices do not matter, it is almost always found, on examination, that the reason lies in the fact that one or another of the other essentials for agricultural development has not been met.

A remunerative price for

Most agricultural product

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TABLE 1.

LAYER FEED - R. I. R. x Leghorn Layers -
SODIUM and CHLORINE CONTENT **

Feed Ingredients	%	Sodium (Na) kg.	Chlorine (Cl) kg.
Corn	10.0	0.010	0.040
Milo	53.8	0.054	0.430
Wheat Bran	4.0	0.024	0.016
Soya Oil Cake	17.0	0.408	0.119
Fish Meal	3.5	0.063	0.144
Oil or Fat	0.7	—	—
Alfalfa Meal	1.5	0.023	0.042
Limestone (CaCO ₃)	8.1	—	—
D.C.P.	0.8	—	—
Salt (NaCl)	0.3	1.200	1.800
Vitamin Premix *	0.3	—	0.040
Total	100.0%	1.782 kg. 0.18%	2.631 kg. 0.26%

* Vitamin Premix containing Vitamins (including 400 g. Choline Chloride), Trace Minerals, Antioxidant, (Ethoxyquin), Methionine.

** According to Mornson, F. B. - Feeds and Feeding 1959.

TABLE 2.

SODIUM AND CHLORINE CONSUMED BY LAYER
(R. I. R. x LEGHORN)
VARYING WATER CONSUMPTION*

Source	Water consumed-		Sodium Chlorine	
	260 cc.	520 cc.	(Na) mg.	(Cl) mg.
Feed Ingredients	130 g./feed/day	76	108	76
Salt (NaCl)	156	234	156	234
Water	260 cc./day	26	52	—
Water	520 cc./day	—	52	104
Total	358	394	384	446

* Average analysis of water - Sodium (Na) 100 p.p.m., Chloride (Cl) 200 p.p.m.

TABLE 3.

SODIUM AND CHLORINE CONSUMPTION
VARIOUS RECOMMENDED LEVELS

Source	Recommended level in feed	Recommended level in feed	Absolute requirement in 130 g. feed/day	
	Sodium (Na) %	Chlorine (Cl) %	Sodium (Na) mg.	Chlorine (Cl) mg.
Prof. Scott (1968)	0.15	0.15	195	195
Agric. Res. Council (Eng.)	0.11	0.06	143	78
Nat'l Res. Council (USA)	0.14	No recommendation	182	No recommendation

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TABLE 4.

COMPARISON OF SODIUM AND CHLORINE
REQUIRED TO SODIUM AND CHLORINE
CONSUMED IN FIELD CONDITIONS

	Daily Requirement mg.	Actual Daily Consumption mg.
Sodium (Na)	143 — 195	258 — 284
Chlorine (Cl)	78 — 195	324 — 446

TABLE 5.

LAYERS — R. I. R. x LEGHORN
TWO LEVELS OF NaCl — SECOND TRIAL

Dietary NaCl - kg./ton	3 kg.	1 kg.
Rate of Lay %	68.6	68.4
Feed consumption per day g.	126.4	123.2
Feed per egg produced g.	184.6	180.2
Body weight at start g.	2280	2220
Final body weight g.	2370	2370
Added body weight g.	90	150

TABLE 6.

COST OF SODIUM IN VARIOUS SODIUM SALTS

Salt		Quantity kg.	Sodium (Na) kg.	Phosphorus (P) kg.	Price IL.
Table Salt (NaCl)	Na 40%	3.0	1.2	—	0.18
Sodium Bicarbonate (NaHCO ₃)	Na 27%	4.5	1.2	—	1.80
Sodium Phosphates	Na 27%]	4.5	1.2	0.864	2.74
	P 19.2%]				
Dicalcium Phosphate	P 17%	5.1	—	0.867	2.24
Net cost of replacing Sodium by sodium phosphates					0.51

TABLE 7.

LAYERS — R. I. R. x LEGHORN
DIFFERENT LEVELS OF NaCl — FIRST TRIAL

Dietary NaCl - kg./ton	4 kg.	2.5 kg.	1 kg.
Rate of Lay %	72.5	73.6	72.6
Average weight of egg (end of trial) g.	61.0	60.9	60.1
Average weight of egg (start of trial) g.	56.5	56.3	55.1
Increase in weight of egg g.	+ 4.5	+ 4.6	+ 5.0
Amount of feed per egg g.	135	131	122
Final body weight g.	2380	2350	2390

TABLE 8.

BROILERS — TWO LEVELS OF NaCl

Dietary NaCl - kg./ton	3 kg.	0.5 kg.
Final weight of broilers g.	1512	1525
Weight of bird at start g.	893	823
Added weight g.	621	632
Feed consumed g.	1920	1940
Feed efficiency g.	1:307	1:309

panor **ABIC**

Continued from page 15

experimental trials and results

The first trial was carried out with R.I.R. Leghorn layers in cages - 2 birds per cage. Each treatment consisted of four replicate groups of 10 birds each. The trial lasted one year. The highest level of NaCl was 4 kg./ton. In the other groups the NaCl removed was replaced by sodium phosphates - the Sodium, Phosphorus and Calcium levels remained constant by appropriate adjustment of the D.C.P. and CaCO₃ levels in the ration.

Results are presented in Table 7. There were no differences between the treatments in bony weight, egg size or rate of lay. However, since feed consumption was lower as the level of salt decreased, a better feed efficiency was obtained.

In addition the droppings of the lower salt groups appeared to be less wet. In this trial it is clear that even in feed containing only 1 kg. of table salt there was clearly no lack of Chlorine.

The second trial was carried out during the sum-

mer heat - on R.I.R. x Leghorn layers, 9 months old at start of trial. The birds were assigned to ten groups of twelve each, five replicate groups per treatment, and records were kept of rate of lay, feed consumption, feed per egg laid, and increase in body-weight.

The two dietary treatments included supplementation with NaCl at a rate of 3 kg./ton. and 1 kg./ton Sodium, Phosphorus, Calcium balanced as above by addition of sodium phosphates and calcium carbonate while decreasing the D.C.P. Results are presented in Table 7.

This trial confirmed the results of the first trial - there was no change in rate of lay. Groups on the ration containing only 1 kg. NaCl consumed 2.6% less feed and feed-efficiency (feed per egg produced) improved by 2.5%

Despite lowered feed intake the weight increase of birds on the low NaCl ration was greater than that of the higher NaCl groups. It is difficult to determine

accurately the relative condition of droppings under field conditions. However, the consensus was that droppings of the low NaCl groups were more solid than of the other groups.

Another trial was carried out with male-broilers from the age of 5 through 9 1/2 weeks. Four replicate groups received feed with 3 kg./ton NaCl, while other four replicate groups received 1/2 kg./ton NaCl. Sodium, Phosphorus and Calcium were balanced as in other trials.

Results are presented in Table 8.

The results show conclusively that decreasing the Chlorine content while keeping the Sodium, Phosphorus, and Calcium unchanged had no negative effect on the growth of the broilers. To the contrary, there was even a slight improvement in efficiency. However, it would seem that the effect is less obvious with young birds than with the larger older layers.

CONCLUSIONS

Results of the above trials clearly proved that a decreased level of salt (NaCl) in the feed - the purpose being to prevent the negative effects of excess Chlorine - while keeping the level of Sodium unchanged by supplying it via sodium phosphates - clearly had no negative effect on the achievements of the birds.

In all the trials there was even a tendency for improve-

ment of results, especially in layers. It is entirely possible that the improved feed conversion was due to improved acid-base balance in the body fluids. It is reasonable to believe that this improved acid-base balance will also improve egg-shell quality.

In all trials droppings were firmer (less wet) as the amount of salt in the feed was decreased.

INCENTIVES

Continued from page 13

particularly to depress prices in local markets at harvest time.

Previously farmers have produced primarily for home consumption. Now, just when they must rely on market prices of their products in calculating costs and returns, they are faced not by stable and predictable prices but by great uncertainty.

Furthermore, this situation is frequently aggravated when governments place ceilings on agricultural product prices. The argument for setting maximum prices for farm products usually is the desire to hold down the cost of living of urban people — industrial workers and government employees.

The result is to reduce the incentives to each farm operator to increase his production just when agricultural development is of prime importance to the nation.

Sometimes farmers increase their production of a crop in response to high prices only to abandon this crop later when they discover that its market price is not dependable.

Farmers in Brazil shifted large acreages to sugarcane, but reverted to growing cereals due to the extreme instability of the price for sugar.

Influencing farm prices:

Recognizing that the level and dependability of farm product prices are important to agricultural development is one thing; doing something about them poses complex problems that are not easy to solve.

No programme to affect farm product prices can be effective in the absence of efficient marketing facilities.

If marketing facilities are inadequate or inefficient, steps

should be taken to improve them. If there is monopoly in the market this may need to be regulated, or encouragement may be given to cooperatives or other new marketing firms to provide competition.

Or a government agency may undertake to buy and sell a commodity at reasonable prices, thus providing an alternative marketing channel. To undertake this, however the agency must have access to the physical facilities needed to handle the commodities it buys. Otherwise it will not be able to make good its guarantees, and the result will be worse than if no regulation of prices had been attempted.

Direct regulation of prices for farm products can be of value, but only if wisely and effectively done, and considerable administrative efforts are always involved. It is important to recognize that prices cannot be regulated merely by passing a law.

Complicated programmes of inspection, and usually of government purchase, storage, and sale of those commodities for which prices are regulated are necessary. In view of the complications, it is best to limit price regulation to only those few commodities of which increased production is most needed.

And for these commodities, the first aim should be to increase the certainty of prices, at levels that will be remunerative to efficient producers.

If it is felt necessary to hold down the cost of food to urban consumers, it is better to do this by government subsidy within the food distribution process than it is to choke off the source of supply by setting low product prices for farmers that deter them from adopting measures to increase production.

Farmers will not grow more

just because the nations need greater agricultural production. They will only do this, they can only do this, to the extent that it is profitable for them to do so, and one of the factors affecting this profitability is the level and the dependability of the prices of farm products.

Prices for supplies and equipment. Prices for farm products comprise one-half of "remunerative price relationships"; the other half is prices for the inputs a farmer may purchase.

An example of how the relationship between the prices of rice and fertilizer differs among countries is indicated in the following table, see page 18

These figures show that whereas it takes only about one kilogramme of rice to buy one kilogramme of either nitrogenous or phosphatic fertilizer in Pakistan or Japan, in India it requires three to four times as much.

Clearly there is more price incentive for a farmer to use fertilizer in rice production in Pakistan or Japan than there is in India as long as these price relationships hold.

But here again we must remind ourselves that it is the relationship between the cost of inputs and the amount by which they will increase production that is important.

Like the prices of farm products, the prices of inputs are often substantially influenced by governmental policies. On the one hand, governments frequently impose heavy import duties on farm supplies and equipment to stimulate domestic manufacture of them.

Such a policy penalizes farmers from the beginning, and may give rise to domestic industries that can exist only with such protection

for a long time to come.

To stimulate such domestic manufacture is frequently sound policy, but to do so in such a way that farmers are discouraged from trying more productive means is self-defeating for the economy of the country.

On the other hand, governments subsidize the use of certain inputs to farmers in order to stimulate use. This does stimulate agricultural development whether or not it is the policy to pursue despite a number of considerations that vary from country to country.

To repeat, what is of the greatest importance is the relationship between prices of farm products and prices of purchasable inputs. This relationship can be affected by allowing prices of agricultural products to be purchasable inputs to be free of specific controls or subsidies or by placing controls or subsidies on one or both.

Each of these has advantages and disadvantages. It is possible to use them in different combinations. It is important to note that the particular combination of policies chosen as recognizing that the relationship between prices for farm products and prices for farm inputs is of importance to the success of the incentives for farmers to increase production.

The effect of the prices of farm products and of prices of inputs on the incentives for farmers to increase production may be summarized as follows:

1. Farmers will increase their production for the market only when they consider the price offered for a particular farm product in the local market to be attractive.

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*Quantity of Rice (in kilograms) Required
To Purchase One Kilogram of Fertilizer.*

Country	(1962)		Super Phosphate (more than 25% P2O5)
	Ammonium Sulphate		
Pakistan	0.85		0.89
Japan	1.18		1.00
U. S. A.	1.47		1.62
U.S.S.R.	3.82		3.19

Calculated from data from: FAO Production Yearbook, Vol. 17, 1963

2. Farmers will respond to changes in the relative prices of crops they are already grow-

ing by increasing production of the crop offering the greater value in the market, unless they feel that

this will jeopardize the food supply of the farm family.

3. Farmers will respond to an increase in price of a

particular crop by using improved methods to increase their production of it (1) if the necessary inputs are locally available, (2) if the farmer feels he knows how to use these inputs effectively, and (3) if the price of these inputs is not too high in comparison with the promised value of the product.

4. Improving the efficiency of marketing to reduce the costs of handling, shipping, and processing farm products can increase the local prices received by farmers for their products, or decrease the price to the ultimate consumer or both.

To be concluded

Continued from p. 6

HINTS ON BROILERS

from different stocks on such factors as growth, feed conversion, viability, and rate of condemnation should be considered.

In large broiler operations, a common practice is to test several stocks on one farm where suitable facilities are available and careful records are kept.

It is important that the housing, feeding, and management be uniform for all stocks in order to obtain a valid comparison of the factors affecting economic return—rate of growth, pounds of chicken per 100 pounds of feed, mortality, and quality of broilers produced.

The information will provide a more reliable basis for the selection of a stock if the tests are repeated on a second or third farm. The farm or farms selected for the test should follow production practices typical of the area.

In integrated operations, the comparisons may include such factors as egg production, fertility, and hatchability of the parent stock. Other considerations are the cost and availability of the stock and the services provided by the supplier.

GROWTH AND FEED EFFICIENCY

Growth (final broiler weight) behaves genetically as a simple quantitative character. The demand of the processor for a white bird created a problem for the geneticist, because the dominant white gene seemed to be linked with some growth-depressing factor.

There seems to be no advantage in using any linear measurement over body weight alone. Growth (9-week weight) has been positively correlated with other important economic factors, such as breast width, body depth, and fleshing.

The relationship of egg production to broiler weight at 9 weeks is important. If it is desired to improve egg production in other wise desirable meat-type breeding stock, it seems advisable to make intense selection for growth rate in stock that is slightly inferior in growth but much superior in egg production.

The more rapidly growing birds are more efficient than the slower growing birds.

It is known that feed efficiency is inherited. There is some question whether it is practical for the commercial broiler breeder to select for it as a specific factor.

It would seem more practical to assume that selection for rapid rate of growth at 4 to 6 weeks of age, and possibly including long shanks, is also selection for high feed efficiency.

Sex-linked genes may be

of considerable importance in the expression of both growth and feed conversion. Since birds selected as early as 4 to 6 weeks do not always grow as expected, further selection is desirable at about 20 weeks and just before they go to the breeding pens.

FEATHERING

Processors demand broilers that are uniformly covered with feathers. Because the sex-linked factor for feathering is inherited in such a simple manner, it is highly improbable that any reputable strain does not already contain a large proportion of early-feathering stock.

The method used allowed us to select chicks for fast feathering at a day old and later to select growing chicks for rapid growth and for superior meat production.

Selection is applied to both males and females and

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BROILERS

to the parental stock producing crossbred broiler chicks.

Selection to obtain breeders that feather rapidly is most easily accomplished at the time of hatching. Fast feathering is a sex-linked recessive to slow feathering; hence, when mated together, male and female breeding birds selected for fast feathering will produce fast-feathering chicks.

Rate of feathering can be determined in day-old chicks by the length of the primary and secondary feather sheaths, of the wing and the number of the secondary feather sheaths. The chick with the highest rate has well-developed primaries and secondaries, with six or more secondaries.

The next best has six or more secondaries, which are not so well developed but are approximately as long as the primaries.

The chick of the slow-feathering type has no secondaries, or less than six short ones, and no primaries, or very short ones. Figure 4 illustrates slow-feathering chicks. About 90 percent of such chicks feather slowly, have no tail-feather development at 10 days, and small primary and secondary wing-feather development.

Some of them will develop into "barebacks" at 12 weeks of age, and many of them will have a considerable number of pin-feathers. These are not good breeders with respect to feathering. In this group the males, in particular, should not be used as breeders.

When selection is made of fast-feathering chicks, they should be raised by themselves, or if this is not feasible, they should be identified

by some means.

Wing banding is considered the best and most permanent means of identification. If this is not practicable, then the chicks may be toe-punched, or a pair of scissors may be used to cut the web between the toes. In any case, some means should be adopted so that such chicks can be recognized at a later age.

BREAST DEVELOPMENT

As the breast meat is the most valued part of the broiler, this characteristic should be given considerable attention in any selection and breeding programme. Observations of breast development should be made when birds are 6 to 12 weeks old.

For these observations each bird should be examined individually and held in a similar position. A good way is to hold the chicken by the legs in the left hand, with its head downward, and with the right hand to examine the width and length of the breast. By comparisons, the birds can be divided into at least four grades.

At this time observations may be made also on any imperfections of the breastbone or skin, such as curved and dented breastbones and breast blisters. Any individual with such imperfections should not be used as a breeder.

With a little experience one soon learns to judge accurately the relative breast development in birds of the same age.

The different breast grades represent measurements used in poultry meat-production experiments at the Agricultural Research Center, Beltsville. This method of classification permits four grades - A, B, C, and D.

If one wishes further divisions, grades A+, A-, B+, B-, and so on can be

used. Only males with A or B breasts and females with A, B, or C breasts should be kept for breeders.

One of the best times to select breeding birds for efficient, rapid growth is at 6 weeks of age, and it is also an ideal age to observe breast development. As both of these observations may be made at this time, one handling of the birds is eliminated.

SHANK PIGMENTATION

Shank pigmentation is inherited. Within the yellow-skinned varieties there are distinct differences ranging from bright yellow and orange yellow to green and sometimes bluish shades. This has not been of sufficient value economically to justify much consideration.

Nutrition and freedom from parasites and diseases affect pigmentation much more than inheritance.

DISEASES (GENERAL)

Chickens differ genetically in their ability to resist invasion by protozoa, bacteria, fungi, viruses, and parasitic worms. It is feasible to develop strains comparatively resistant to *Eimeria tenella* coccidium, fowl typhoid, pullorum disease, visceral lymphomatosis, Newcastle disease, "blue comb," and encephalomalacia. However, it has not been determined whether it is economically feasible to do so in any case.

When severely exposed to respiratory disease, the strain cross progeny of good non-inbred strains fared better than their pure parent strains.

The S6 strain of avian pleuropneumonia-like organisms (PPLO) *Mycoplasma gallisepticum*, an agent, or one of the agents, in the air-sac disease complex or airsacculitis, is present in most broiler breeders,

The ultimate objective is

to eliminate the infectious agent from breeder flocks. A blood test can be used to detect noninfected flocks. It has no value in detecting individual birds, as in the pullorum test.

Dipping eggs in antibiotic solution can help in reducing PPLO in breeders, but is of questionable value in the routine treatment of eggs for broiler production.

As airsacculitis is the largest single cause of condemnations, the elimination of PPLO from breeders is very important. Foundation breeders should assume the responsibility for cleaning up all their breeder flocks.

Both male and female lines must be clean. In order to facilitate the development of "clean" flocks, breeders may, with insignificant genetic loss, relax selection for 8- or 9-week body weight for one generation.

Both broiler breeder replacement and broiler chicks should be from parent stock free of PPLO. Therefore, in commercial production of replacement stock, reasonable geographic isolation of serologically tested negative birds is important. Special precautions should be taken to see that management isolation is not disrupted at any time.

LEUKOSIS

The amount of leukosis in broiler condemnations and total mortality are often masked by conditions such as septicemia and airsacculitis. There is no practical test by which the infected hen, egg, or chick can be detected. A hatchery should not accept eggs from a breeder flock with a high incidence of leukosis.

The ability of certain strains of birds to resist the virus that causes visceral lymphomatosis, the most prevalent form of

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"THE PILL"

Again, this is not typical in Britain, where one ram to 40 or 50 ewes is generally felt to be sufficient.

Where it is not economi-

cally possible to have more rams, and they cannot be borrowed or hired, artificial insemination (a.i.) may become more popular. This is particularly likely where a breeder wants to make use of top quality rams to make a rapid improvement in his whole flock.

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BROILERS

leukosis, has been shown to be due to genetic factors. Culling of flock is most effective if done on a family basis, and entire families with individuals showing indications of the leukosis complex, such as irregular pupils, marble bone, or other symptoms, should be eliminated.

A highly susceptible strain should not be used for crossing purposes. Since the disease can also be transmitted by direct contact between chickens in the same hatching or rearing units, isolation procedures are essential. There is no known treatment for leukosis.

NUTRIENTS

The requirement for certain amino acids—arginine, methionine, but not lysine—is inherited. Genetic differences have also been exhibited for the A, B₁, D₃, E, and riboflavin vitamin factors, the unidentified growth factors, manganese, calcium, and zinc.

Again, selection for rapid growth normally emphasizes the individuals most capable of efficiently using these nutrients and leads to the elimination of those having an abnormally high requirement for them.

Basically any individual with an abnormal requirement for any nutrient should be eliminated as a breeder.

PLUMAGE COLOUR

Growth rate and other characteristics may be affected

by the genes that determine plumage colour of broilers. For example, the gene for silver apparently has to be associated with the gene that extends black and with recessive white for maximum growth.

If white birds are desired, the dominant white gene needs to be combined with the gene causing barring.

Colour sex-linkage for determining sex at hatching has not made progress because the females are not white. Processors want all bird to be white.

EGG SIZE

Broiler chicks from large eggs (24 to 28 ounces per dozen) are definitely larger at hatching than those from small eggs (18 to 22 ounces). As broilers grow the effect of this relationship is less, but it is still definite at 8 and 12 weeks for b.d. weight and possibly for feed conversion.

The trend in early chick mortality is high in 18 to 1 ounce egg.

When hatching eggs are scarce and more small eggs are set, broiler raisers observe that mortality tends to increase and growth and feed conversion suffer. In independent operations, broilers from larger eggs usually bring a greater cash return per bird over feed costs. However, in an integrated operation, broilers from smaller eggs may give greater total returns over egg and feed costs.

It has always been the most obvious advantage of A. I. that it enables a small number of top quality male animals to be used on an exceptionally large number of females, with often startling results. More meat, milk or wool can be obtained in a reasonably short time by herd or flock improvement through A. I.

Pressure on output

Control over the female's breeding cycle makes A. I. even accurate and effective, and it should lead to increased use of both techniques as world-wide pressure grows to increase farm output and productivity.

The same pressure is forcing livestock production in many countries to become more intensive, with vast numbers of animals being housed and fed on fewer and fewer acres (hectares).

In these big beeflots and milk "factories", or in the large pig production units, controlled breeding could enable farmers to utilise their labour, machinery and buildings even more effectively. Synchronisation of cattle mating (either natural mating or through A. I.) and calving, could be timed to achieve maximum output of milk or beef at the period when market prices are the most attractive.

At present there are no "birth pills" or other control devices for cattle on the market in Britain although several of the major pharmaceutical firms are working on the project.

No Problem With Pigs:

In pigs there is not the same need for artificial control of breeding in a dult sows, as oestrus can be regulated very successfully by weaning groups of sows on the same day. About 80 per cent will exhibit oestrus

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NEWS

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TRACTOR HIRING

OPERATIONS GO UP TWOFOLD

TOTAL OF 9,120 ACRES WAS CULTIVATED IN THE UPLAND AND FADAMA AGRICULTURAL OPERATIONS IN THE NORTH WESTERN STATE THIS YEAR. THIS SHOWED AN INCREASE OF OVER THE ACREAGE CULTIVATED IN THE OPERATION LAST YEAR.

A release from the States Ministry of Natural Resources here gave the provincial totals of cultivated acres as 920 and 6,200 for the Niger and Sokoto Provinces respectively.

The release further stated that the acreage cultivated this year is expected to be doubled in the coming season.

The Tractor Hiring Unit operations of the Ministry of Natural Resources, confirmed the statement had this year increased by 100% over that of last year.

This, the release added, is due to "intensive extensive campaigns by the Agricultural Extension Staff" and also "the grant made by the State by the Federal Government for Agricultural Production Scheme".

Another report from the same Ministry said that 24 students have passed out from the Talata Mafara Farm Training Centre as Agricultural Instructors.

These the report added, could bring the number of Agricultural Instructors produced by the Centre to 240.



A NEW CULTIVATOR

First public demonstration by a British manufacturer of the new Salix Spring Tine Cultivator—an attachment designed to speed arable work on the farm. Among its built-in benefits are: four-bar-high carbon steel frame for strength and high speed working conditions; frame bars spot marked for easy time positioning when necessary shot peened lines fitted with reversible points, precisely tempered for vibrant action and made from the finest steel available; and screw top adjustable depth control wheels with pneumatic tyres.

The attachment is available in a wide choice of widths—from 9ft. 6in. to 25ft. 9in.—and can be used with tractors from 40 hp to 110 hp.

Manufacturer: Richard T. Evans, Eynon, near Leamington, Herefordshire, England.

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features will include

1. Farmers need INCENTIVES (2)
2. What is C. R. D. in Poultry ?
3. At the Cocoa Research Institute, Ibadan & lots more

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HORTICULTURE

ready for markets at the same time. Customers want soft leafy stuff. Saten, they do not live my strings in the mouth - a proof of firmness.

Every State's Ministry Agriculture has a Demonstration Centre where you could be horticulturists give guide. The officials will be happy to help you with your questions.

Try horticulture and hearing the jingle of ins in your pocket always.

Next time, we shall talk out preparing the ground.



This 23 in (584.2mm) rotary grasscutter is recently introduced by a British firm. Powered by a 5 hp, four stroke engine, the machine is designed to fill a gap between the smaller domestic grasscutter and the large professional model. Controls are placed conveniently on the handles which can be adjusted to the height of the user. Manufacturer: Walsley Engineering Ltd., Electric Avenue, Wilton Birmingham 6, England.

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"THE PILL"

within four Jays.

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Manufacturers referred to: Ovarid pill for dogs - Glaxo Laboratories Ltd., Greenford, Middlesex.

Syners-Mate for sheep - G. D. Searle and Company Ltd., Lane End Road, High Wycombe, Buckinghamshire

Pig and poultry compounds - Imperial Chemical Industries Ltd., Millbank, London. S. W. 1.

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