

**THE BEST OIL IS CHEAPEST**

**WHETHER** your separator runs hard or easy will tell in your profits. The easier it operates the less wear, the longer durability, the surer the returns on your investment.

Remember—it's the gears and bearings that take the wear. Lessen it with Standard Hand Separator Oil—made especially to reach and lubricate the revolving parts. Pure, highly fluid, non-gumming. As necessary as a special oil for your automobile.

Sold in pint, quart, half-gallon, gallon and 4-gallon cans; also barrels and half-barrels. By reliable dealers everywhere.

**IMPERIAL OIL LIMITED**  
BRANCHES THROUGHOUT CANADA

**Standard Hand Separator Oil**



**PEERLESS GATES**

Down the road or far across the fields often an "entrance," a mere hole in the fence, a constant source of danger to stock getting through. The best way to

**Keep Your Stock Where You Want Them**

is to avoid rough, cheap and shabby. All Peerless Farm Gates are of heavy open heart steel wire on strong tubular steel frames electrically welded in one solid piece, and braced like a steel bridge. No sag, no rust, no wearing out. Ask your dealer to show you Peerless Gates, also Peerless Perfection Farm and Poultry fencing with the famous Peerless lock at all intersections.

**SEND TODAY FOR CATALOG.** It tells you how to put up a fence to "stay put."

**The Banwell-Hoxie Wire Fence Co., Ltd.**  
Winnipeg, Manitoba Hamilton, Ontario



**TWO-THIRDS** of all rural barn claims settled by 40 insurance companies in Ontario, over a period of 12½ years, were due to

## LIGHTNING

You can prevent the loss of your buildings and reduce the cost of your insurance by equipping them with rods made by

**The Universal Lightning Rod Co.**  
**HESPELER ONTARIO**

Send for Free Literature To-day

Farm and Dairy stands foursquare against everything that is detrimental to the farmers' interests, and whatever appears in its columns, either advertising or editorial, is guaranteed reliable.

Write  
**Ontario Department of Agriculture**

for Bulletin No. 220.  
On page 3 you will see the following:

"To-day we know from experience that Lightning Rods, properly installed, are almost absolute protection."

## When a Balanced Ration is Not Balanced

(Continued from page 5.)

soluble vitamins—which is now known to be necessary for growth—is supplied abundantly in butterfat. Vitamines are substances that have an importance in rations until recently not understood. It was thought possible that the wheat grain plus wheat straw ration was somewhat deficient in this material. But later additions, however, did not uniformly improve the ration, for while we had a number of successful reproductions with its use, we also had a number of failures. This would again emphasize the probability of the presence of a toxic substance in the wheat grain. When, however, wheat straw was mixed with a legume hay, such as alfalfa, so that the latter formed but 20 per cent. of the ration, we had perfect success in all cases in the production of normal offspring. The improvement resulting from the use of alfalfa must lie in introducing into the ration a better mixture, perhaps a better protein mixture, and an abundance of growth-promoting substances (vitamines), all of which may contribute toward making it possible for the animal body to combat successfully the toxic factors introduced.

We had thought it possible in our earlier work that the bad results secured with the wheat ration were due to the acidity of this ration, as the urine of the wheat-fed animals showed consistently a slight acidity due to the low intake of calcium, magnesium, sodium and potassium. If this were true, then the addition of acids to the successful corn ration would give results similar to those obtained with the wheat ration. This, however, we found not to be the case, for when mineral acids, such as sulphuric or phosphoric acids, were added to the corn ration in such proportion that the acidity of the urine was as agreeable similar to that of the wheat-fed animals, the offspring were strong and normal in every respect. There is a prevailing theory that too high a content of magnesium in an animal's ration may lead to disastrous results, but in our work the addition of a large amount of magnesium salts to a corn ration did not in any way disturb the production of normal offspring.

The results just detailed indicate clearly that the wheat grain contains a toxic material and later work shows that this is largely present in the embryo of the seed. When wheat embryo is used with corn stover so as to bring into the ration four or five times the amount of embryo that would be introduced when feeding whole wheat, an early abortion results. Cows on this ration drop their calves at six or seven months. These facts show that increasing the amount of toxic material produced this disturbance at a somewhat more rapid rate.

Microscopical studies were made on the spinal cords of calves fed largely upon wheat rations, and showed that there was a watery condition of those nerve cells especially concerned in body movements and that they were compressed and partially degenerated. This condition is analogous to that of beriberi, a disease which occurs among the people of Japan and China as a result of eating too abundantly of polished rice. The cause of beriberi is ascribed to the absence or deficiency of certain vitamins in the diet. In the case of wheat it would appear that the essential disturbing factor is a toxic substance which interferes with the utilization of materials necessary for the normal development of the nervous system of the animal or acts on the nervous system. It is possible, of course, that it may induce degeneration of the nerve tissue of young or mature animals. This would account for the blindness observed in the heifers and also for the failure of muscular co-ordination apparent in the newborn calves of crossbred stock.

It is not to be concluded from these studies that whole wheat or those more common wheat products such as middlings and wheat bran cannot be used with success, but will continue to be used; but when employed too exclusively and not in conjunction with other feeds, the various nutritive difficulties are likely to arise. As pointed out, we have fed wheat and wheat straw with the production of normal calves, when it has been supplied with about 20 per cent. of the ration of alfalfa or clover hay. The calves produced on such rations were normal for the first gestation period. Only when we compared these animals on the same ration for the second gestation period were the calves born weak, underfed, and in some cases blind. It was the long continued use of the material without change in the ration that was finally fatal to normal production. The cumulative effect of the toxic material finally showed its effect.

A few years ago there was a late season drought in Nebraska. A large wheat crop was matured, but the corn crop failed. The dairymen of that state fed, during the following fall and winter, abundance of whole wheat. In many cases there were reported troubles in reproduction. The calves were dropped ahead of time and were either dead or weak and undersized. It is altogether probable that the chief cause of these disasters was a too intensive use of wheat and wheat products.

Corn stover is not as good a corrective of the harmful effects of wheat as are the legume hays. In many instances we have had success in reproduction with corn stover constituted 50 per cent. of the ration and the remaining 50 per cent. consisted of wheat meal and wheat gluten. In such instances we have had failures. We have, however, had successful wheat embryo directly with perfect success in a single gestation when it constituted 14 per cent. of the ration and when, in addition, corn meal and corn stover were used in the proportion of approximately 30 and 50 per cent., respectively, of the ration. The ration consisted of four pounds of corn meal, two pounds of wheat embryo, one pound of cornstarch and seven pounds of corn stover.

These experiments indicate how a combination may be made to include a material harmful in itself and yet so mask its toxicity with corrective agents as to produce good results.

This is undoubtedly the common experience on the farm. Barn rations are changed occasionally, and summer pasturing comes in as another change. These broken periods with different rations, even if they occasionally contain some mildly toxic material, are really too short to bring out the effects of toxicity on growth and reproduction. But how much the constant use of a ration containing a mild toxicity may weaken the animal, making the offspring less vigorous and strong and the mother less resistant to disease, is a question that may well be raised as a result of these experiments. Is a herd receiving wheat products continuously and abundantly more likely to be constant sufferers of abortion and tuberculous, or is a herd receiving continuously a ration physiologically complete, such as our corn ration, developing a resistance to the ravages of such diseases? These questions we cannot answer at the present time, but in an outbreak of anthrax in the university herd the only losses to occur in our experimental herd were among the wheat-fed animals.

When farmers use wheat straw or oat straw too freely as a roughage there will likewise arise trouble in reproduction. Unless some sort of good roughage, as corn stover or

mixed hay is raised and constant attention of the breeder is given to the matter, we are in much trouble among our stock, much as we are in the case of the factors in the ration. We are so far from the little improvement in the reality, corn stover, the vitamins, the hay, the health and as wheat straw, and hays, when roughage, sufficient, or air in the matter. These are all given on to be defective, fertile solid, and the found the safe roughage.

FARM

Tales

H. Percy

THE

ions

Can

know

In sorrow

lity in per-

plenty or ex-

alone, which

is a little girl

our big dis-

So, out-

tory, when

Ermine, she

driving the

On the ground

out the fruit

the story.

pit, cow

would, but

table as po-

of which w-

in origin.

We look

Chas. for

"m."

nothing str-

is, "Agricu-

is, in the

women of t-

vators. It

ancient Lat-

of savage

fought, or

the women.

Other wo-

Bacon cottag-

ful mother

weather—th-

girls are at

young maid-

were "spint-

stied too li-

did the m-

"daughte-

very senten-

farther tale.

More; becau-

the man wou-

"Urbain," th-

here." The

mark of the

as among the

the baby, th-

the "Bo

R.I.C.) He w-