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 Treasurer: A. W. Orton

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A. O. U. W. - LAKEVIEW LODGE, No. 111
 Meets every second and fourth Thursdays each month in Masonic Hall, Lakeview. Chas. Tomlinson, W.M.; Wm. Gunther, F. S. Recorder.

DEGREE OF HONOR - LAKEVIEW LODGE, No. 77
 Meets every first and third Thursdays of each month in Masonic Hall. Little Harris, C. of H.; J. S. Lane, R. M.; Mary Post, C. of C.; J. S. Lane, Recorder.

I. O. O. F. - LAKEVIEW LODGE, No. 111
 Meets every Saturday evening in Odd Fellows Hall, at 7:30 o'clock. From Dec. 1 to April 1, and at 8 o'clock from April 1 to September 30. A. E. Cheney, N. W.; J. S. Cheney, Secretary.

I. O. O. F. - LAKEVIEW ENCAMPMENT No. 1
 I. O. O. F. Meets the second and third Thursdays of each month in Odd Fellows Hall, Lakeview. C. D. Arthur, C. P.; A. H. Hammerley, Secy.

SEBASTIAN LODGE - LAKEVIEW LODGE, No. 22
 I. O. O. F. Meets the second and fourth Fridays of each month in Odd Fellows Hall. Mrs. Ida Herford, N. G.; Mrs. Edna Miller, V. G.; F. W. Payne, Secretary; Mrs. L. J. Magilton, Treasurer.

E. S. ORIENTAL CHAPTER, No. 5, LAKEVIEW, Oregon
 Meets on Tuesday, on or before full moon and two weeks thereafter, in Masonic Hall, at 7:30 o'clock. Visiting members are cordially invited. CORNELIA A. WATSON, W. M.; IDA UEBACH, Secretary.

CHURCH DIRECTORY

METHODIST EPISCOPAL CHURCH - Lakeview
 First Sunday in each month, preaching at 11 a. m. Aside from this, preaching every Sunday at 11 a. m. and 7:30 p. m. at Lakeview. Sunday School at 10 a. m. Lecture at 6:30 p. m. Prayer Meeting, Thursday, 7:30 p. m. Ladies Aid, Wednesday, 1:30 p. m. Choir practice, Friday, 7:30 p. m. A cordial invitation is extended to you. C. B. REES, Pastor.

FIRST BAPTIST CHURCH OF LAKEVIEW
 Preaching service at 11 A. M. and 7:30 P. M. on 1st and 3rd Sun. Sunday School at 10 A. M. Junior Society at 2:30 P. M. Baptist Young People's Union at 6:30 P. M. on each Sunday. Prayer Meeting at 7:30 P. M. on Wednesday evening. Every body invited to attend at all times. Pastor: J. H. THOMAS.

CATHOLIC CHURCH - EVERY SUNDAY MASS
 and Benediction with Exposition of the Blessed Sacrament. Mass at 7:00 a. m. and 10:00 a. m. MICHAEL O'MALLON, S. J.

BEST BAPTIST CHURCH OF GOOSE LAKE
 at Newport, Oregon. Preaching on 1st and 3rd Sun. at 11 A. M. and 7:30 P. M. on each Sunday. Prayer Meeting at 7:30 P. M. on Wednesday evening. Every body invited to attend at all times. Pastor: J. H. THOMAS.

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THOS. J. POWELL
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 Office in Daily Building
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Home Course In Modern Agriculture

XIII.—How Animals Grow

By C. V. GREGORY.

Agricultural Division, Iowa State College
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ANIMALS, unlike plants, can obtain none of their food from the soil, air or water, but must have it prepared for them. Without plants there could be no animal life, since animals are dependent upon them, either directly or indirectly, for food. A study of the way animals make use of this food in building up their bodies will help us to better understand the principles of feeding.

There are three main constituents of feeds—fats, carbohydrates and albuminoids, or protein. The fats are made up of carbon, hydrogen and oxygen. The carbohydrates, of which starch and sugar are familiar examples, are made up of the same elements put together in different proportions. Another of the carbohydrates is cellulose, or the woody fiber of plants. This is hard to digest, but some of it is used in animal growth. Albuminoids contain not only carbon, hydrogen and oxygen, but nitrogen also. In addition to these three constituents of food it also contains some mineral elements, which are commonly referred to as ash.

This ash is used in building up the bones, hair, horns and hoofs. The al-

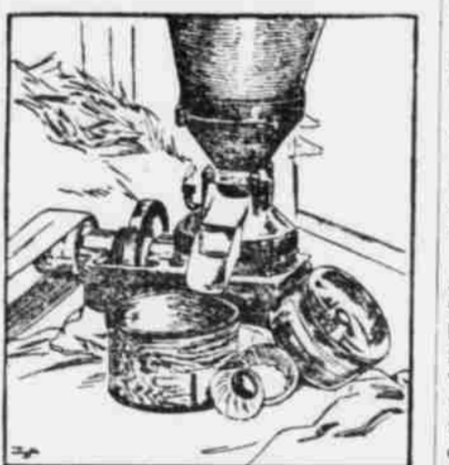


FIG. XXV.—GROUND FEED IS DIGESTED MORE QUICKLY AND COMPLETELY THAN WHOLE GRAIN.

buminoids also form a considerable portion of these parts of the body. Their chief use, however, is in building up the muscles, tissues and various organs. The fats and carbohydrates are used to furnish energy and heat. They are the fuel of the body. By uniting with oxygen they give off the heat and energy required to keep the body running, in much the same way that the elements of coal or wood unite with oxygen to furnish heat and power when burned in a steam engine. Not all of the fats and carbohydrates are burned immediately, however. Some of the fats go to build up fatty tissues. Some of the carbohydrates are changed to fats and used in the same way, and some are stored in the liver in the form of glycogen to be used when needed.

Before these various food elements can be used by the animal they must go through a process called digestion. The first step in digestion consists in taking the food into the mouth. Each class of animals has a different way of doing this. Watch the cows feeding in the pasture. They reach out their long tongues and gather in a mouthful of grass, breaking it off with a peculiar twist as it comes against their lower teeth. They cannot bite it off, since they have no upper teeth in front. The horse gathers in the grass with his lips and bites it off between his teeth. For this reason horses can eat grass down much closer to the ground than cattle can.

After the food is taken into the mouth it is chewed and mixed with saliva. This saliva serves two purposes—to soften the food and to change some of the starch to sugar. This change is brought about by the action of enzymes which the saliva contains. These work in the same way to do the same thing in a grain, either whole, which passes the food for the bird's plant.

Sugar and starch, as we have learned, are both composed of carbon, hydrogen and oxygen, the only difference being that they are put together in a little different way. The action of the enzymes changes the relation of these elements in the starch, arranging them in such a manner as to form sugar.

All the starch in the food must be changed to some form of sugar before it can be used by the animal in building up the various parts of its body. Since the food remains in the mouth only a comparatively short time, however, only a small part of the starch can be acted upon there. The rest is changed later, as we shall see.

The main purpose of the saliva is to moisten the food. This moistening, together with the chewing, reduces it to a moist, finely divided mass, ready to be swallowed and acted upon by the other digestive juices.

While the essential processes of digestion are the same for all animals, the way in which the work is carried on varies somewhat. The horse and the hog have but one stomach. As the food enters this a churning motion begins, which gradually forces the partially digested mass along toward the lower end. The saliva continues to act on the starch, and another fluid, the gastric juice, is poured

out from the walls of the stomach. The main duty of this gastric juice is to change the albuminoids into a form in which they can be absorbed and used by the animal.

Cattle and sheep have a very large stomach, which is divided into four parts. Animals of this kind are called ruminants. When the food is swallowed it passes into the first stomach, which serves the purpose of a storehouse. Here the action of the saliva continues, and the water which the animal drinks softens the food to a considerable extent. After a time the food passes into the second stomach, which forces it back to the mouth, a little at a time. Here it is chewed thoroughly. You have often seen cows lying in the shade "chewing their cud." This cud is the food that has been sent up to the mouth by the second stomach.

After being chewed the food is swallowed again. This time it passes directly through the first stomach to the third. Here it becomes still further softened, finally passing into the fourth or true stomach. The function of the first three compartments is simply to prepare the food to be acted upon by the true stomach.

After leaving the stomach the partially digested food passes into the small intestines. Here it is acted upon by three fluids—the bile, pancreatic juice and intestinal juice. The chief use of the bile is to digest the fats, making them into a sort of a soapy fluid, in which form they are ready to be absorbed into the blood. Both the pancreatic and intestinal juices act upon the remaining starch, completing the change into sugar. The pancreatic juice also completes the digestion of the albuminoids, in which work the intestinal juice may also take a small part. Another work of the pancreatic juice is to assist in decomposing the fats. The intestinal juice breaks cane sugar up into simpler sugars, such as glucose.

After the food has been digested the usable portions are ready to be absorbed into the blood. Digestion has changed the fats, proteins and starches into a form in which they are soluble. In this fluid state they pass through the walls of the stomach and intestines and are emptied into the blood.

The blood is taken to all parts of the body by the arteries, which subdivide to form tiny capillaries. These are so small and close together that a pin prick on the skin anywhere will pierce some of them. There are two main parts to the blood—the fluid of plasma and the red corpuscles—which give it its color.

Each part of the body selects from the blood the food materials which it needs. Thus the bones will take ash, while the muscles will take protein, to build up their wornout parts. The waste, broken down parts are burned, together with as much fat and sugar as are needed, to furnish heat and energy. All through the body there are thousands of little fires. To keep these fires going oxygen is used, and carbon dioxide is given off in the same way that a fire in a stove takes in oxygen through the lower draft and sends carbon dioxide up the chimney.

In the body the corpuscles supply the oxygen and carry away the carbon dioxide. The other waste materials, or ashes, are gathered up by a system of vessels called lymphatics, which empty into the veins. These veins carry the blood back to the heart. The elements of the contents of the corpuscles from oxygen to carbon dioxide change the color of the blood from a bright red to a sort of darker shade.

From the right side of the heart, to which the blood is brought by the

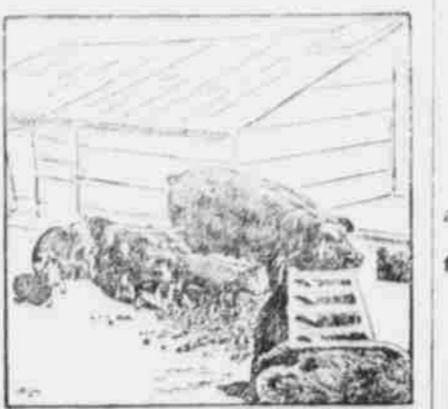


FIG. XXVI.—SUFFERING TIME.

veins, it is sent to the lungs, where the corpuscles exchange their carbon dioxide for oxygen and are ready for another trip through the body.

Since oxygen plays such an important part in keeping up the fires that supply the body with heat and energy, it is just as important that the animals be well supplied with fresh air as it is that they have enough food. In the winter especially the stables are often closed so tightly in the attempt to keep them warm that the air becomes very deficient in oxygen. In consequence the work of the lungs is delayed and the general health suffers. By having ventilators in the roof, together with plenty of windows at such a height that the wind will not blow directly upon the animals, the fresh air can be admitted and the fire drawn off constantly.

A Promising Experiment.



Hostess—And what interesting experiment are you engaged on now, professor?
 Professor—Raising canaries from canary seed.

The New Farm Hand.



Grumpy Farmer (engaging a man)—Well, you'll do. Start right away.
 Farm Hand—I think I'll please ye, sir. I've had a lot to do with pigs.

The Optimist.



"Waiter, this knife is blunt, and the steak is like leather."
 "Yes, sir; do nicely for stroppin' the knife on, sir."

"A Hunting Case Watch."



Not the Same.



Evelyn—If I had an airship I'd fly away and seek my fortune.
 Howard—If you had an heirship, your fortune would come to you.

Enchantment Viewpoint.



The Victor—There! Now you ought to be satisfied. You said you was looking for a fight.
 Canny Canute (the vanquished)—Ye-e, but I only wanted to watch R from a distance.

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