HOME COURSE IN SCIENTIFIC **AGRICULTURE**

ELEVENTH ARTICLE. FEEDING FARM ANI-MALS, NO. 1.

By E. W. ALLEN, Assistant Director of the Office of Experiment Stations, United States Department of Agriculture.

HE feeding of farm animals. like the use of fertilizers for crops, rests upon quite well defined general principles. The materials of the body are continually breaking down and being consumed. and to keep the snima! in a healthy and vigorous condition there must be a constant supply of new material. If, in addition to repairing the wastes of system and furnishing it with heat and energy, growth is to be made (as in the case of immature auimals) or milk secreted an additional supply food is required. To supply food in the right proportion to meet the various requirements of the animal with out a waste of food nutrients consti-



Photo by Long Island experiment station MOTOR PARM WAGON PILLING THE SILO.

tutes scientific feeding. It is by carefully studying the composition of feeding stuffs, the proportion in which they are digested by different animals and under different conditions and the requirement of animals for the various food nutrients when at rest, at work, giving milk, producing wool, mutton, beef, pork, etc., that the principles of feeding have been worked out. In applying these principles in practice the cost and special adaptations of different feeding stuffs must of course be taken into account.

The animal body is made up mainly of four classes of substance-water, ash or mineral ingredients, fat and nitrogenous matters. Water constitutes from 40 to 60 per cent of the body and is an essential part. From 2 to 5 per rent of the weight of the body is ash. This occurs mainly in the bones. The int varies greatly with the condition of the animal, but seldom falls below 5 per cent or rises above 30 per cent. The nitrogenous material or protein includes all of the materials contain-ing nitrogen. All those outside this group are nitrogen free, or nonnitrogenous. Nitrogen occurs in plants and animals in various compounds grouped under the general name of protein The flesh, skin, hones, muscles, interasl organs, brain and nerves-in short, all of the working machinery of the body-are composed very largely of protein. The albuminoids are a

of compounds included under protein. The food of herbivorous animals contains the same four groups of aub stances found in the body-viz water ash, protein (nitrogenous materials) and fat and, in addition to these, a class of materials called carbohydrates,

defined below. However dry a feeding stuff may ap pear to be, it always contains a considerable amount of water. amount may be only from eight to fif teen pounds per 100 pounds of material, as in hay, straw or grain, but in green corn fodder and silage it amounts to nearly eighty pounds and in some roots to ninety pounds. This water, although it may add to the palatability of a food, is of no more benefit to the animal than water which

Ash is what is left when the combustible part of a feeding stuff is burned away. It consists chiefly of lime, magnesia, potash, soda, iron, chlorine and carbonic, sulphuric and phosphoric acids and is used largely in making bones. From the ash constituents of the food the digestive organs of the animal select those which the animal needs, and the rest is voided in the As a general rule, rations composed of a variety of nutritions foods contain sufficient ash to supply the requirements of the body. however, is poor in ash, and when fed extensively to growing animals, like pigs, it may be necessary to add to it some ash material, as wood ashes charcoal or bonemeal

Fat or the material which in analysis is dissolved from a feeding stuff by ether includes, besides real fats, wax, the green coloring matter of plants, etc. For this reason the ether extract is usually designated crude fat. The fat of food is either stored up in the body as fat or burned to furnish heat and energy.

Carbohydrates are usually divided tract, including starch, sugar, gums and the like, and (2) cellulose or fiber, the essential constituent of the walls of vegetable cells. Cotton fiber and wood pulp are nearly pure cellulose. Coarse fodders, like hay and straw, contain a large proportion of fiber, while most grains contain little fiber, but are rich in starch, sugar, etc. (nitrogen free extract.) The carbohydrates form the largest part of all vegetable foods. They are not permanent ly stored up as such in the animal body, but are either stored up as fat or burned in the system to produce beat and energy. They are one of the principal sources of animal fat.

Protein (or nitrogenous materials) is the name of a group of materials containing nitrogen. Protein materials are often designated as "flesh formers," because they furnish the materials for the lean flesh, but they also enter largely into the composition of blood, skin, muscles, tendons, nerves. hair, horns, wool, the casein and albumen of milk, etc. For the formation of these materials protein is absolutely indispensable. No substances free from nitrogen can be worked over into protein or fill the place of protein Under certain conditions it is believed protein may be a source of fat in the body, and finally it may be burned, fike the carbohydrates and fat, yielding beat and energy.

The value of the fat for producing bent is nearly two and a half times that of carbohydrates or protein. The sources of fat in the body are the fat, carbohydrates and probably the prosource of protein in the body is the protein in the food. These groups of food materials are termed nutrients.

To a certain extent at least the nutrients may replace one another, although, as stated above, no other nutrient can take the place of protein. The fat and carbohydrates perform similar functions, and, to a large extent, carbohydrate materials may replace fat in the food, even when a large fat production is demanded of the animal, as in the case of the cow.

The composition of feeding stuffs, or the proportion in which the nutrients occur, is determined by chemical analy Only a portion of the nutrients b of direct use to the animal-i. e., only that digested. A part of the food is dissolved and otherwise altered by the juices of the mouth, stomach and in testines absorbed from the alimentary canal, and in the form of chyle passes into the blood and finally serves to nourish and sustain the body. The other portion is excreted.

As the rates of digestibility are not constant for different foods and as only the digestible portion is of any nutritive use to the animal, it is essential to know in the case of each feeding stuff what part of its protein, fat and carbohydrates (the total quantity of which is shown by analysis) is actually digested by the animal. This is determined by digestion experiments with animals, and to secure an proximately accurate figures the trials are repeated with a large number of animals and under various conditions. The digestibility of such coarse fod ders as straw, coarse hay, etc., is relatively low. The digestibility, like the composition, varies somewhat for the same kind of feeding stuff grown under different conditions and fed to different animals.

Calculations have been made of the amounts of digestible protein, fat and carbohydrates contained in 100 pounds monly used feeding stuffs. They are the figures which the farmer has to consult to find the approximate food value of a material in selecting his feeding stuffs or making up a ration. They are available in various publica tions, including those of the United States department of agriculture.

For example, in 100 pounds of green fodder with an average amount of dry matter (27.7 pounds) there are contained approximately 1.10 pounds of digestible protein (materials containing nitrogen), 12.8 pounds of digestible carbohydrates (starch, sugar, fiber, etc.) and 0.37 pounds of digesti ble fat, and these materials when sumed in the body will yield 26,076 calories, or units, of heat, furnishing energy for work and bodlly heat.

An ox standing in the stall requires less food nutrieats than one which worked hard every day. In stand ing in the barn it still requires some protein, fat and carbohydrates to perform the necessary functions of the body to maintain heat in winter, to grow a new coat of hair, etc. But if it is fed the same ration as when working hard the tendency is to get fut or waste the food.

The cow requires not only materials for maintenance, but must also have protein, fat and carbohydrates to make milk from. The milk contains water, fat, protein (casein, or curd), sugar and ash, and these are all made from the constituents of the food. If insufficient protein, fat and carbohy-drates are contained in the food given her the cow supplies this deficiency for a time by drawing on her own body and gradually begins to shrink in quantity or quality of milk, or both. The stingy feeder cheats himself as well as the cow. She may suffer from hunger, although her belly is full of swale bay, but she also becomes poor and does not yield the milk and butter she should.

KEEPING THE MILK SWEET IN SUMMER

During hot weather many farmers have trouble with sour milk This causes much loss not only to the farmer who keeps one or more cows for into two groups: (I) nitrogen free ex- family use, but especially to the dairyman who retails his milk or ships it to a dealer in the city. The dealer usually pays only one-half price for sour milk or refuses to accept it at any price, thus entailing heavy loss to the

Sweet milk can be produced and delivered in prime condition to the customer in the hottest summer weath writes a Kentucky dairyman in the New England Homestead. I have for five years shipped milk a distance of fifty seven miles, the milk being three hours on the train, and have not had a drop of sour milk during that time These shipments ranged from sixty to ninety gallons a day. During about half of this time the milk was shipped in eight and ten gallon cans, the re mainder of the time in quart and pint

Good sweet milk depends on two items-cleanliness and cold tempera-To secure these the following rules should be observed:

Have the cow's udder clean before milking. A clean damp cloth can be



Red Polled cattle originated in the east of England and are an old dual purpose breed. They are good milki-ers and also take on flush easily and quickly when put on fattening feed. The cow shown is Liza, own-ed by A. P. Arp of lows. In 1916 she yielded 10.007.70 pounds of milki-containing 515.55 pounds of milki-containing 515.55 pounds of butter fat. The next year she gave 2.765 pounds of milk with 63 pounds of butter fat, the total for two years being 20.572.75 pounds of milk con-taining 198.25 pounds of butter fat. exet of England and are an old

used for this purpose and can be carried in the pocket of the milker. Only a few seconds are required to wipe the udder off immediately before begin-ning to milk the cow. In my experience this simple expedient has worked

Be careful not to allow hairs, dust or dirt to fall into the milk. They are all laden with germs. Germs cause the milk to sour. The greater the number of germs the quicker the souring will occur. A pail with a small opening will be very helpful in keeping out dust and other dirt.

Use the milk pail for no other purpose than for milking. Some dairymen use it for watering the horses and slopping the hogs and then wonder why the milk sours.

Cool the milk immediately by running it over a milk cooler or by im-mersing in cold spring or well water. The animal heat must be removed before placing in cans or bottled for de-livery or shipment. If necessary to hold the night's milk for shipment until the next morning it should be held at a low temperature. Cold springs or well water in a wooden or metal tank of proper size to hold shipping cans may be used for this purpose. If running spring water is at hand this will serve admirably. In some cases the milk or cream may be lowered into a cistern and kept cool until time for shipment. If care is exercised milk can be kept sweet without ice, but a ly of tee to very desirable

Another important point-wash all saels carefully. Examine frequently in the angles to see that no accumula tion of yellow, slimy casein material collects, as this will certainly cause rapid souring. After washing scald all vessels with boiling water and place in pure fresh air until ready for use. If exposed to the sun so much the better, as sunlight is the best germ killer and purifier.

Grooming Heavy Horses.

Horses left ungroomed and undried are liable to skin nilments, sore backs, willar galls and parasitic affections. Chills and illness also follow in the wake where animals receive faulty attention in this respect. Half an hour twice a day on grooming is time well spent. Many light draft horses have their bodies clipped, and not a few are clipped all over. Clipping enables the animals to do the work more easily and facilitates the keeping clean of the body. The profuse awenting seen with a heavy cont is avoided, and the risk of subsequent chill is made less. The week after clipping is, however, dangerous for catching cold, and the considerate horseman always clothes the animal at such a time when standing or takes his join cloth with him.

Treatment For Pink Eye.

influenza, often called pink eye, usnally contracted by contagion in strange stables, should be treated as follows: Bandage the legs from feet to body with soft straw or hay rope. Allow the horse all the cold water he wants to drink. In each pallful of water dissolve two teaspoonfuls of saltpeter. Three times a day give him ten drops of fluid extract of beiladonna tenves, one dram of fluid extract of gentian root, half a teaspoonful of saltpeter and four tablespoonfuls of whisky in some water as one dose.-Farm Jour

Great Improvement in Forest Ranges

Washington, July 7.- The improved condition of the national as a demonstration that areas which have been severely damaged through overstocking by sheep and cattle can be brought back to their former carrying power through a system of sufficiently intelligent use.

charge of the livestock ranges within the national forests some of them were so badly overgrazed and otherwise injured from reckless handling of the stock that their grazing value appeared to have been almost entirely destroyed. Many of these ranges, however, have been restored and made as valuable as ever. On several of the forests results have more than justified the expectations and the range is in better condition than it ever

An example of this Improve ment is cited in the Nebo national forest, Umb. In 1908, when that forest was created, the ranges within the forest boundaries were found to be budly overgrazed and trampled because there was a lack of any control, One of the areas was at that time estimated to be capable of carry ing only 3,000 head of cattle. Now, through conservative man-agement and judicious distri-bution of the cattle over the bution of the cattle over the ranges, and improvements in water conditions, the carrying capacity of the range has been increased until, in the present grazing season, nearly 8,000 head

ble phenomena of dust and sand storms in the arid regions of the west, every cubic mile of the lower air during an ordinary "dry storm" contains at least 225 tons of dust, while in severe storms of this kind as much as 126,000 tons of dust and sand may be contained in a cubic mile of nir. Dust storms sometimes last for twenty or thirty hours.

DO ALL THINGS WELL

Do not think you can do anything worth doing in a fit of enthusiasm, but train yourself carefully to any work that you are called to do and think nothing too small to do carefully that is for the good of your fellow creatures.

Anything That Came Handy. Howell-How does that woman strike you? Powell - With any old thing. She's my wife.

A Remedy. Benham-He called me a driveling idlot. Mrs. Benham--Well, don't drivet.-Exchange.

DO YOUR BEST. Let us be content to work, To do the things we can and not presume To fret because it's little. -Elizabeth Barrett Browning.

When in the market for Lime, Ce ment and Shingles, see the Redmond Lumber & Produce Co. 3-27-2m

For Sale.

A 45-horse power Case traction en-gine and log trucks. Will sell on easonable terms. R. E. Jones & Co Howard, Ore.

For Sale.

160 acres of good farming or grazing land for sale cheap. Owner must sell. A real bargain. Address Box 265, Prineville, Orc. 6-19-1m

Blaze face bay mare, Y brand on left shoulder, scar on right hind leg above stiffe. Should have colt fooled about June 5th. \$15 reward to find-Notify Henry Bivins, Culver, Ore. 6-19-4tp

Melville Sewing Machines for rent. J. E. Stewart & Co. 5-1

New Home Sewing Machine for rent Popular prices. At Kamstra's, 5-15

Sheriff's Sale on Attachment Exe-

Whereas, on the 21st day of May whereas, on the 21st day of May, 1915, by consideration of the circuit court of the state of Oregon, for Crook county, the First National Bank of Bend, a corporation, recovered a judgment against D. V. Mackintosh for the sum of \$674.00 and in proved condition of the national forest range after regulated grazing is pointed to by experts of the department of agriculture as a demonstration that areas that the property attached in said action be sold for the satisfac-tion of said judgment, in the manner provided by law, which judgment was enrolled and docketed in the cierk's office of said court on the 22d day of May, 1913, commanding me to sell the following described real property to wit

when the government took with ordered of section 20, township 17, 8, R, 12 E. W. M., and the with of the swith 17, 8, R, 12 E. W. M., and the with of the swith 17, 8, R, 12 E. W. M., and the swith 17, 8, R, 12 E. W. M., and the swith of the swith of the swith of the swith of section 30, township 17, 8, R, 12 E. W. M., and the swith of section 30, township 17, 8, R, 12 E. W. M., all in Crook county.

Notice is hereby given that I will, On Saturday, the 26th day of July, 1913, at the hour of 2 o'clock in the after-noon, at the front door of the court house, in Prineville, Oregon, sell to the highest bidder for cash, all the right, title and interest the said D. V. Mackintosh had in and to the above described real property on the 21st day of May, 1918, to sartisfy the judgment, costs and according costs. Said sale subject to redemption as provided by law. roylded by law,

First publication, June 26, 1913. FRANK ELEDS, Sheriff of Crook County, Oregon.

Notice for Publication (Department of the Interior) S. Land Office at The Dailes, Ore, May 19, 1913.

May 19, 1915.

Notice is hereby given that
John L. Walsh
of Imperial, Oregon, who on April
1915, 1911, made homestend No. 08687,
for swi, section 28, and owl; section
35, township 29, south, range 18 cast
Willamette meridian, has filed notice
of intention to make final three-year
proof to establish claim to the land or supervision over the areas, proof to establish claim to the land above described, before A. S. Fogg. U. S. Commissioner, at his office at Hampton, Oregon, on the 14th day Prinkville . . Oregon of July, 1913.

Claimant names as witnesses: To

Notice for Publication. Department of the Interior, Land Office at The Palles, Or July 2nd, 1913. Notice is hereby given that Ernest C. Kimmell

grazing season, nearly 8,000 head of cattle are using this particu lar srea, and forest officers feel that a few hundred head more can be safely grazed there with out injury.

Thousands of Tons of Dust.

According to the estimates of a government expert, who has given much attention to the study of the remarks.

Ernest C. Kimmell 27th, 1909, made homestead entry No. 05783, for nely section 32, township 16 youth range 15 east, Willamette meridian, has filed notice of intention to make final three-year proof, to establish claim to the land above described, before Timothy E. J. Duffy, U. S. cemmissioner, at Princeville, Oregon, on the 18th day of August, 1913.

Claimant names as witnesses: Given Hendrickson, Jacob Becker, Harry Van-Meter and George H. Ratliff, all of Princeville, Oregon.

Prineville, Oregon.
7-10 H. FRANK WOODCOCK, Register,

Sheriff's Sale of Real Estate Under

Execution in Foreclosure In the circuit court of the state of M. C. Brink Annie Maling, plaintiff,

Fred T. Higgins and Mrs. A. C. Jordan and A. C. Jordan, her husband, defendants. By virtue of an execution in fore-

By virtue of an execution in fore-closure issued out of the above entitled court and cause on the 9th day of July, 1913, in favor of the above named plaintiff, Anne Maling, and against Fred T. Higgins and Mrt. A. C. Jordan and A. C. Jordan, her bueband, above named detendants, upon a judgment against the defendants for the sum of \$588.50 and interest thereon from the against the defendants for the sum of \$388.50 and interest thereon from the \$388.50 and interest thereon from the Sth day of March, 1913, at the rate of 10 per cent per annum and for the sum George W. Watt, Plaintiff, of \$50 attorney's fees and the further ment was enrolled and docketed in the clerk's office of the county of Crook, state of Oregon, on the 12th day of May, 1913, and whereas it was further ordered and decreed by the court that the ng nw;, and the swinw; and the nw; swi of section 16 in township 18 south of range 17 east, W. M. in Crock county, Oregon, containing 160 acres, be sold in the manner prescribed by law, and in pursuance thereto, notice is

hereby given that I have levied upon and I will on the 9th day of August, 1913, at the north door of the county court-house in Princville, Crook county, Ore-gon, at the hour of 2 o'clock in the gon, at the hour of 2 o'clock in the afternoon of said day, sell all the right, title and interest the said defendants, Fred T. Higgins and Mrs. A. C. Jordan and A. C. Jordan, ber husband, had in and to the said described real property to the highest bidder, to satisfy said independ interest attorney's fees judgment, interest, attorney's fees costs and accruing costs, subject to re-demption according to law. First publication July 10th, 1913.

FRANK ELKINS, Sheriff of Crook county. By W. E. Van Allen, deputy.

Notice for Publication.

U. S. Land Office at The Dalles, Or. June 28th, 1913. Notice is hereby given that Warren Libby

Superior Niagria and Columbia
Ranges \$37.50 to \$65. Sold on installment plan. It will pay you to investigate if you are in the market for a Range. J. E. Stewart & Co. 5-1

Strayed
Blaze face bay mare, Y brand on intention to make final three-year proof to establish claim to the land above described before A. S. Fogg, U. S. Commissioner, at Hampton Oregon, on the 11th day of August, 1913.

Claimant names as witnesses: Paul Held, William H. Burchtorf, Lloyd Baker, Walter M. Smith, all of Heid, Oregon.

H. FRANK WOODCOCK Register. Professional Cards.

N. G. WALLACE W. P. Myens

MYERS & WALLACE

Lawyers Kamatra Bld'g, Prineville, Ore

The J. H. Haner Abstract Co.

Insurance

Princytlle, Ore. Farm Loans. Bonds.

Prof. A. W. Grater,

Divine Healer Office in Morris Building three doors south of Journal office, Prineville, Oregon

D. H. PEOPLES Civil and Irrigation Engineer Prineville, Ore.

Dr. Howard Gove

Dentist. Crook County Bank Building

J. H. Rosenberg Physician and Surgeon

Calls unswered premptly day or night Office two sours south of Completen's Dray Sines Residence documents to and Wain Stones

Chas. S. Edwards H. P. Belknap

Bolknap & Edwards

Physicians and Surgeons.

(County Physician.)

Prineville. T. E. J. DUFFY

Attorney at Law

Obsections 10 W. A. Belll.

C. C. Brix

Kitarney-at-Law Real Estate Cornett Building, Room 6

Oregon E. O. Hyde

Physician and Surgeon

Ualla ASSERED PROMPTLY DAY OR NIGHT OFFICE ONE DOOR SOUTH OF ADARSON'S DAYS STORE. Both office an residence telephones.

Princeville.

Oragon

R. Elliott,

Attorney-at-Law

Willard H. Wirtz

Attorney-at-Law, Office in M. R. Biggs' office, PRINEVILLE OREGON

Lawyer A street, Prineville,

Oregon. J. Tregelles Fox

M. B. C. S. Eng; and L. S. A. London; Licencee Oregon State Medical Board. Specialist in Surgery; Hygiens; All-mentary Canal; women and children's diseases, etc. Office and residence Third street near Court House. Tel. Pioneer, Calls answered promptly, night or day. Charges moderate

Summons

In the Circuit Court for the State of Oregon for Crook County.

Vs. George N. Eckler, Defendant. To George N. Eckler, the above named defendant:

In the name of the state of Oregon: on are hereby required to appear and answer the complaint filed against you in the above entitled sult on or before Thursday, the 14th day of August, 1913, and if you fall to so answer, for want thereof, the plaintiff will apply to the court for the relief demanded therein, namely: That the plaintiff have and recover from George N. Eckler, the sum of \$800.00 with interest thereon at the rate of six per cent per annum from the 23d day of March, 1909, and for the further sum of \$150.00 attorney's fees, and for the costs and disbursements herein; that the mortgage dated May 23d, 1908, and signed by you and 23d, 1968, and signed by you and covering the following property to-

All of the northeast one-fourth of the southwest one-fourth, and the vest half of the southeast one fourth of section eight (8), and the north-west one-fourth of the northeast onefourth of section seventeen (17), in township No. 11, south of range No. 19, east of the Willamette meridian, 19, east of the Willamette meridian, in the county of Crook, state of Oregon, containing one hundred and sixty (160) acres, be foreclosed and said property be sold by the sheriff of said county to satisfy the plaintiff's note and mortgage, and that you and all persons claiming by, through or under you be forever foreclosed of all right, title or interest in or to said property, except the statutory right of redemption, and for such other and further relief as to the court may seem just and equitable.

nbie This summons is served upon you by publication thereof once a week for six consecutive weeks in the Crook County Journal, by order of the Honorable W. L. Bradshaw, judge of the above entitled court, which order is dated June 20, 1912.

which order is dated June 30, 1913.
CLINTON A. AMDROSE,
Attorney for plaintiff, 3134 Washington St., Portland, Oregon. Date of first publication, July 3, 1913

Date of last publication, August 14,