sixteen per cent of nitrogen and on account of this they are spoken of as the nitrogenous constituents. 2nd, *Nitrogen Free Extract* includes starch, sugar, substances resembling gum, mucilage, etc. 3rd, *Fibre;* this is the woody matter found in all plants, in the flax and in cotton plant it is the part that gives us the material from which linen and cotton clothes are made. 4th, *Fat;* this is determined by dissolving with ether and evaporating the ether, leaving the fat or oil to be weighed. In the seeds of some plants, for example, cotton and hemp, the fat is found in large quantities and is pressed out and used for numerous purposes. 5th, *Ash;* This is the part left after burning a sample of the substance.

The following table shows the chemical composition of corn meal and shorts; the figures are an average of many determinations made at the Massachusetts Experiment Station:

	Corn meal.	Shorts.
Water	13.16	11.5
Water free substance	86.84	88.5
Water free substance contains:		
Albuminoids	10.19	16.1
Nitrogen free extract	68.92	52.3
Fibre	2.50	10.0
Fat	3.87	4.0
Ash	1.36	6.1
	86.84	88.5

This is the customary method of starting an analysis, showing the *total composition* of fodders. But it is not in shape to be used by the feeder as a means of determining the nutritive value of these two products, because the animal fails to get the full amount of nutritive matter shown by analysis. Food, to be of any value to an animal, must be rendered soluble, so that it can be absorbed and carried through the system in the blood. This process of making the constituents of the food soluble is known as *digestion*, and is effected by the juices of the mouth, stomach, intestines, etc. If animals could digest the whole of the albuminoids, or other parts of corn meal or shorts, then the analysis above given would show the nutritive value. But it has been found that such is not the case. Only a part of each substance is digested. We may illustrate this point by supposing that some one puts on the market a mixture of coal and gravel stones, eighty pounds of the former and twenty pounds of the latter, in each one hundred pounds. The value of this, as fuel, is only that of the eighty pounds of coal, and any estimate based upon the *total weight* would be erroneous. In the same way each constituent of corn meal is made up of two parts, one *digestible*, corresponding to the coal in our assumed mixture; the other, *indigestible*, and corresponding to the gravel stones. The value of any kind of food is based, not on its total composition, but on the *digestible* parts. It is necessary, therefore, to know what portion of each constituent is rendered available by the digestive juices. The method employed is briefly as follows: An animal is placed in a stall where no food can be wasted, a record of all food consumed is kept, and from the analysis it is possible to compute the exact amount of *albuminoids, fibre, nitrogen free extract* and *fat*, that has been taken into the system during the entire experiment. All the parts of the food that are not digested pass unchanged through the intestines and are found in the manure, consequently, if all the manure is weighed and samples are analyzed, it is easy to compute the albuminoids, fibre, nitrogen, free extract and fat, that has passed through the animal unchanged, and these subtracted from the amounts taken into the system will show what portion has been rendered available by digestion. The degree of digestibility is usually expressed by stating the number of pounds that are digestible in one hundred pounds of each constituent. For example, it has been found that of each one hundred pounds of albuminoids fed in corn meal eighty-five pounds are digested. This eighty-five represents the *per cent* of digestibility of albuminoids in corn meal, and is called *digestion co-efficient*. Of the nitrogen free extract, ninety-four out of every one hundred pounds is digestible, in other words, ninety-four is the *digestion co-efficient* of the nitrogen free extract of corn meal. In the same way it is found that thirty-four and seventy-six are the digestion co-efficient of the fibre and fat, respectively. For shorts the figures are eighty-eight, eighty, eighty, and twenty, for albuminoids, nitrogen free extract, fat and fibre. To get the analysis above given into shape to be of value to the feeder, it is necessary to determine what the composition is when *only* the *digestible* part is considered. This is done in the following table:

	Corn Meal.			Shorts.		
	Total composition.	Digestion co-efficient.	Amount digestible in 100 lbs. meal.	Total composition.	Digestion co-efficient.	Amount digestible in 100 lbs. shorts.
Water	13.16	....	....	11.5	....	....
Water free substance	86.84	....	....	88.5	....	....
Albuminoids	10.19	85	8.66	16.1	88	14.17
Nitrogen free extract	68.92	94	64.78	52.3	80	41.34
Fiber	2.50	34	.85	10.0	20	2.00
Fat	3.87	76	2.94	4.0	80	3.20
Ash	1.36	....	....	6.1	...	....

In this table, in the third and sixth columns we have the available nutritive material in corn meal and shorts, but as the digestible nitrogen free extract and digestible fibre are equally valuable these two may be added together, and in most stock feeding tables this is done, the name carbo-hydrates being given to the sum of the two; this term, carbo-hydrate, means that portion of the digestible part of food which is made up of three elements, carbon, hydrogen and oxygen, the last two elements being in the ratio of two parts of hydrogen and one part of oxygen.

[TO BE CONTINUED.]

Veterinary.

Parturient Apoplexy, Milk Fever, Puerperal Fever, Calving Fever, Dropping After Calving.

BY DR. HINEBAUCH.

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The causes are predisposing and exciting. Among the first may be mentioned high condition; well fed cows, especially heavy milkers, suffer most seriously and extensively from this disease. One attack usually predisposes to another. Age has a great influence, parturient apoplexy being most often noticed from the third to the seventh calving. The exciting cause is the act of parturition. The first symtoms are usually manifested at from one to three days after calving. The sooner they are developed the more serious and fatal will be the disease. There will be diminished secretion of milk, hanging of the head, loss of appetite, and paddling with the hind feet. As the disease progresses the breathing becomes hard and loud; there will be knuckling of the fetlocks, and finally the animal drops; will perhaps rise, then drop, and will be unable to rise again; breathing becomes slower, accompanied by a peculiar moan. The eyes are blood-shot, wild and staring; the ears, horns and forehead hot, the extremities cold. At first the cow dashes her head about violently, but finally becomes quiet and insensitive to surrounding objects. The head will be thrown around, resting against the side with the nose upon the ground. In some cases the cow lies on her side with the head and legs outstretched. The power of swallowing may be lost or imperfectly maintained. The pulse, at first full, gradually becomes quick, small and almost imperceptible. During the first stages there is slight fever, but the temperature soon falls below the normal; the bowels are constipated, with retention of urine. These symptoms will run their course in from two to twenty-four hours.

The treatment which I recommend is that which I have successfully used the past two seasons, and which can be applied by any one who handles cattle. My attention was first directed to it by an article in the London Veterinary Journal for August, 1887. The first thing necessary is to place the animal in as near a natural recumbent position as posible, keeping her in place with bundles of hay or straw. Place a rope around the horns and fasten the head so that it will be held in a natural position, then give at once (1) twenty to thirty ounces of whisky or a pint of brandy, well diluted with warm water. About half an hour afterward administer (2) from one to two pints of good molasses dissolved in hot water. The molasses creates a thirst; the animal will drink greedily two or three hours after it has been given, and should then be allowed plenty of good pure water. Apply plenty of ice or cold water to the head. If cold water, see that it is applied every ten minutes. A common grain sack wrung out is very good. If the cow is inclined to keep dashing her head about, apply a check rope to the horns, in order to keep her from bruising her head or breaking off the horns. Do not attempt to draw the milk for there is none secreted. If the animal is not comatose, repeat the dose (1 and 2) in four hours, and continue doing so every six hours until you see her recovering. In my experience, with one exception, I have never given more than two doses, one sometimes being sufficient, recovery usually taking place in from twelve to thirty-six hours. Pure alcohol in one-half the dose may take the place of the whisky or brandy. The body should be kept warm with plenty of light woollen blankets.

Veterinary surgeons, or those who have hypodermic syringes, will get excellent results by injecting ten grains of pilocarpin combined with two grains of physostigmine (eserine), in which case remedies 1 and 2 need not be employed. Intertrachial injections give better and quicker results than when injected under the skin.

If the above treatment is resorted to in the early stages of the disease, before the power of swallowing is lost, nearly every case will recover. This disease is easily prevented, but somewhat difficult to cure. For two weeks previous to calving diminish the food. Keep the bowels active by small doses of Epsom salts or a laxative diet. Avoid all highly nutritious food. The common practice with some people of giving extra feed at this period to increase the flow of milk is, without doubt, the most prolific cause of this disease.