

skilfully used, the best effects on the size of the calf and the firmness of the meat may be anticipated."

This Scientific note from Professor Johnson has engaged the attention of many stock masters in Ireland, and amongst the rest, Mr. C. Beaumish, of Cork, who adopted and brought it to a regular system on an extensive scale. His formula for compounding the mucilage is as follows:—Thirty quarts of boiling water are poured on three quarts of linseed meal and four quarts of bean meal. It is then covered up close; and in 24 hours added to 31 quarts of boiling water then on the fire, pouring it in slowly, and stirring it constantly to prevent lumps, with a perforated wooden paddle, so as to produce perfect incorporation. After boiling 30 minutes, the prepared mucilage or gruel is put by for use, and should be given blood or luke warm to the calves, mixing it in small quantities at first with the milk, say one fourth, mucilage with three-fourths milk, progressively increasing it, so that by the end of a fortnight it will be in equal parts; by the end of the third week, one and a half mucilage to one part milk; by the end of the fourth week the mucilage may be given in double the quantity of milk, and skim milk substituted for new milk, and by the end of the sixth week, the mucilage may be gradually increased in the proportion of two and a half to one of milk, and from that out till the tenth week the milk may be gradually reduced, so that by that time they may be fed wholly on mucilage till they are fifteen or sixteen weeks old, when they may be weaned.

During all this time, if too early in the season to put out the calves, they should be comfortably housed, well ventilated, and kept perfectly sweet and clean, a little sweet hay tied in bundles, and suspended so that they may play with it, and learn to nibble and eat it, and a little pounded chalk, mixed with salt, given in troughs to lick at pleasure, which prevents acidity in the stomach, and the undue formation of cud; small lumps of linseed cake should also be given in troughs, which they will soon learn to suck, if a little pairs are taken to put a bit in their mouths after they have taken their meals of milk and mucilage. When housed it will be advisable to have a separate pen for each calf of sufficient size to walk about, so that they don't get into the habit of sucking each other, and swallowing the hair, which, uniting with the curd, by the regurgitating process going on in the stomach, forms round balls, which are indigestible, and is the fertile cause of the death of many promising animals. The following scale of quantity of milk or milk and mucilage combined for each calf may be useful, but should be altered according to circumstances:—For the first week the calf may get from 3 to 4 quarts daily; from the second week, 4 to 5 quarts; the third and fourth weeks, 5 to

7 quarts; fifth and sixth weeks, 8 to 10 quarts; sixth to eight weeks, 10 to 12 quarts per day and so on, increasing the quantity about 1 quart per week per calf till weaning time.

Some parties do not give so much liquid food per day, but make it up by giving them first cut roots, dry oatmeal, &c., but the animals are much too young for such food, though they may get the minced roots, so as to train them in their use. Hay tea is an admirable thing to mix with the mucilage and milk, as it contains a large amount of nutriment in a soluble form.

In the summer time the calves may be put out on the grass, both day and night, in a fortnight after they are calved, and fed as already described they should be in the house; but warm, sheltered paddock should be provided for them, and in wet weather they should have access to a covered shed.

Straw as Food.

By C. W. JOHNSON, F. R. S.

(Concluded from page 297.)

In one portion of this essay the Professor closely and elaborately examines the nutritive and non-nutritive portions of the various kinds of straw met with in the stack-yard. Of the non-nitrogenised or carbonaceous substances found in straw, he observes: "Their use in the animal economy is of a two-fold character—either to supply the materials for the formation of animal fat, or to support respiration, and consequent animal heat. These different carbonaceous substances are not, however, equally well adapted to either of these uses, and may be divided according to the fitness and readiness with which they fulfil the one or the other functions, into—

1. Fat-producing substances.
2. Heat-producing or respiratory substances.
3. Indigestible substances.

"To the first belong the oil, fat, and wax matter, which in straw, as already mentioned, seldom amount to much more than 1 per cent. Oily and fatty vegetable substances are eminently well adapted to the laying on of fat in animals, inasmuch as the composition of vegetable fat is analogous if not identical with the several kinds of fat in the bodies of animals. The fatty matters of food without undergoing much change are therefore readily assimilated by the animal organism, and applied when given in excess to the storing up of animal fat. On the other hand, substances rich in starch are especially fitted to support respiration. Oily and fatty matters, however, when given with a scanty supply of starchy food, become available for the support of respiration; and again, gum, starch, and sugar, when given to fattening beasts to eat, are transformed into animal fat. There is no essential difference between the fatty