Stock Department.

On the Food Value of Straw.

An interesting lecture was recently delivered before the Athy Farmers' Club, Ireland, on the composition and feeding value of straw, by Dr. C. A. Cameron. The lecture and subsequent discussion are reported at length in the Mark Lane Express, from which we condense the following abstract, believing that though the remarks were originally delivered with reference to the condition of Irish agriculture, they are equally applicable to the circumstances of this country and climate. Dr. Cameron observed that the straws of the cereal and leguminous plants are a striking illustration of the erroneous opinions and practices which prevail amongst agriculturists with respect to particular branches of their calling. The German farmers regard straw as the most valuable constitutent of home-made fertilizers, and their leases in general prohibit their selling off the straw produced on their farms. Yet chemical analysis has clearly proved that the manurial value of straw is perfectly insignificant, and that, as a constituent of stablemanure, it is chiefly used as an absorbent of the liquid egests of the animals whose litter it had formed. As food for stock, straw was at one time regarded by our farmers as almost perfectly innutritious ; some even went so far as to declare that it possessed no nutriment whatever; and even those who used it did so more with the view of correcting the too watery nature of turnips than with the expectation of its being assimilated to the animal body. Within the last few years, however, straw has been largely employed by several of the most intelligent and successful feeders in England, who report so favourably upon it as an economical feeding stuff, that it has risen considerably in the estimation of a large section of the agricultural public. Now, even without adopting the very high opinion which Mechi and Horsfall entertain relative to the nutritive power of straw, I am altogether disposed to disagree with those who affirm that its application should be restricted to manurial purposes. Unless under circumstances where there is an urgent demand for straw as litter, that article abould be used as food for stock, for which purpose it will be found, if of good quality, and given in a proper state, a most economical kind of dry fodder-equal, if not superior, to hay, when the prices of both articles are considered. The composition of straw is very different from that of grain. The former contains no starch, but it includes an exceedingly high proportion of woody fibre; the latter is, in great part, composed of starch, and contains but an insignificant amount of woody fibre. Dr Voci-cker, the consulting chemist to the Royal Agricul-tural Society of England, and Dr. Anderson, chemist to the Highland and Agricultural Society of Scotland. have made a larger number of analyses of the straws of the cercal and leguminous plants, the results of of the cercal and leguminous plants, the results of which are of the highest interest to the agriculturist. Many very important conclusions are deducible from the facts recorded in these valuable tables. We learn from them that straw is more valuable when it is cut in the ripe state than when it is permitted to over-ripen, and that green straw contains a far greater amount of nutriment than is found even in the ripe article. It appears also that the least nutritions kind of straw equals the best varieties of turnips in its amount of field forming principles and arcenting. its amount of field forming principles, and greatly ex-ceeds them in its proportion of fat-forming elements. Wo further learn that in general the different kinds of the most nutritious occupying the higherst nutritions of the least nutritious occupying the highest, and the least nutritions the lowest place: 1, pea haulm; 2, oat straw; 3, bean straw with the pods; 4, barley straw; 5, wheat straw; 6, bean stalks without the pods.

The following was given as the analysis of an average sample of oat straw:---

Water	14 00
ricen-forming principles-	
. Bolubie in water	4 08
•. Insoluble in water	2.09
	_1 64
outer, gom, and other ist-forming matters	13,79
Without The States	59.04
	4:4

The annexed table shows the constitutents of wheat straw cut in various stages of ripeness:-

	No. 1. Green, changing to yetlow	No. 2. Ripe.	No. 3. Over- ripe.
Water	13.00	13,15	12.14
a. Solublo in water	1 25	0.99	0 44
 Insoluble in water 	1 26	1 40	1 41
011	1 22	1 13	1 1 1
Sucar, gum, and other fat forming			1
matters	4 18	3.98	3.58
Woody fibro	75.84	76 17	17 78
Mineral matter (ash)	3.25	3.19	J.23
	100.00	100.00	100.00

These analyses show that our wheat straw is allowed to over-ripen, by which a very large proportion of its nutritive principles is eliminated and altogether lost, and a considerable part of the remainder converted into an insoluble, and, therefore, less casily digestible state. Nor is there any advantage to the grain gained by allowing it to remain uncut after the upper portion of the stem has changed from a green to a yellowish color; on the contrary, it also loses a portion—often a very considerable one—of its nitrogenous or flesh-forming constitutents. It has been clearly proved that wheat cut when green yields a greater amount of grain, and of a better quality, too, than whea it is allowed to ripen fully; yet how often do we see fields of wheat in this country rilowed to remain unreaped for many days, and even weeks, after the crop has attained to its full development!

As compared with white turnips, the nutritivo value of oat straw stands very high; for whilst the former contain but little more than one per cent. of fleshformers and less than five per cent. of fat-formers, the latter includes about four per cent. of fat-formers, and thirteen per cent. of fat-formers. Again, whilst the amount of woody fibro in turnips is only about three per cent. that substance constitutes no less than sixty per cent. of oat straw. In comparison with hay-taking into consideration the prices of both articles-oat straw also stands high, as will be seen by comparing the following analysis of common meadow hay with that of properly harvested straw:

COMPOSITION OF MEADOW HAY. (Mean results of 25 analyser.)

Water	14.61
Flesh forming constitutents.	8.44
Rest fratory and fatty matters	43 63
Woody fibre.	27.16
Mineral matter (anb)	6.16
	100.00

Woody fibro is as abundant a constituent of the straw of the cercals as starch is of their seeds, and if the two substances were equally digestible, straw would he a very valuable food—superior even to the potato. At one time it was the general belief that woody fibre was incapable of contributing in the slightest degree to the nutrition of animal . but the results of recent investigations prove that i is, to a certain extent, digestible.

A series of experiments were detailed which clearly prove that the straws of the cereals possess a far higher nutritive power than is commonly ascribed to them: that when properly harvested they contain from twenty to forty per cent. of undoubted nutriment; and lastly, that it is highly probable that its so-called indigestible wooly fibre is to a great extent assimilable. The composition of cellulose is nearly, it not quite, identical with that of starch, and may, therefore, be assumed to be equal in nutritive power to that substance—that is, it will, if assimilated, be converted into four-tenths of its weight of fat. Now, as cellulose forms from six-tenths to eight-tenths of the weight of straw, it is evident that if the whole of this substance were digestible, straw would be an exceedingly valuable fattening food. When straw in an unprepared state is core med, there is no doubt but that a large proportical of its cellulose remains unappropriated—nay, more, it is cully certain that the hard, woody fibre pro ects, by enveloping them, the soluble and easily digestible constituents of the wroed igestible that when the straw is merely cut, or even when it is reduced to chaff, subject it to the action of steam, and mix it with roots and oilcake or corr. A better and cheaper plan is to mix the straw with sheed roots, moisten the mass with water, and allow it to remain until aslight formentacake or cors of nutritious matter which is fore the stores of nutritious matter which is the straw is high estimation prefer giving it just as it comes from the field; they base this predice on the belief that raminants reby proper treatments

quire a bulky and solid food, and that their digestive powers are quite sufficient to effect the solution of all the useful constitutents of the straw. It may be quite true that cattle, as asserted, can extract more nutriment out of straw than horses can, but that merely proves the greater power of their digestive organs. No doubt, the food of the ruminants should be bulky; but cooked orfermented straw is sufficiently so to satisfy the desire of these animals for quantity in their food. All the carefully conducted feeding experiments to test the value of straw which have been made have yielded results bighly favorable to that article. Mr. Blundell, in a paper on "The Use and Abuse of Straw," read before the Botley (Hampshire) Club, states .hat, in his experience, he found straw to be more economical than its equivalent of roots or oilcake in the feeding of all kinds of cattle. "I find," says Mr. Blundell, "that dairy cows, in the winter months, if fed on large quantities of roots, particularly mangels and carrots, will refuse to cat straw almost entirely, and become very lean; but they will always cat a full portion of sweet, well-harvested ance of roots, say, for an ordinary sized cow, 15lbs. of mangel three times per day, the roots being given when they have been kept under cover I have had them in first-rate condition for many years past. Also, in faiting beasts, when they get a fair allowance of roots—say Gölbs. to 70lbs. per day, with from Sibs. to 4lbs. of cake or meal in admixture—they will eat straw with great avidity, and do well upon it, and when they have been kept under cover I have had them in first-rate condition for many years past. Also, in faiting beasts, when they get a fair allowance of roots—say Gölbs. to 70lbs. per day, with from Sibs. to 4lbs. of cake or meal in admixture—they will eat straw with great avidity of cake or meal, often 10lbs. or 12lbs. per day; they will not then look at straw, and when they have been kept under cover I have bad them in first-rate condition for many yea

If we turn now to the study of the composition of straw, regarded from an economic point of view, we shall find that the theoretical deductions therefrom harmonize with the results of actual feeding experiments. Let us assume that one hundred parts of oat straw contain on an average—one part of oil, four parts of flesh-formers, ten parts of sugar, gum, and other fat-formers, and thirty parts of digestible fibre; and if the price of the straw be 30s. per ton, we shall have at that cost the following quantities of digestible substances:—

ONE TON OF OAT STRAW, AT 308., CONTAINS:		
00	108.	
Flesh forming principles.	89.6	
Sugar, gum, and other fat-forming substances	224.0	
Digestible fibre	672.0	
	008.0	
Total amount of fut-formers, calculated an	1000.0	
starch	952.0	
Add flesh-formers	89. 0	
Total emount of nutriture metter 1	011 6	

We shall now compare this table with a similar one in relation to the composition of Inseed-cake, which will place the greater comparative value of straw in a clearer light. A fair sample of linseed-cake contains, centesimally—

Flesh-formers	28 12 34 6
ONE TON OF LINSEED-CARE, AT £11, CONTA	INS.
Flesh-forming principles On Gum, sugar, and other fat formers Woody flore	1ba 582.4 209.8 761.0 74.4
Total amount of fat-formers, calculated as starch.	1,687.2 1.508.0 582.4
Total amount of nutriment	2,090.4

These comparisons are very instructive and important. We learn from them that we pay £11 for 2,000 lbs. of nutriment when we purchase a ton of linseedcake; whereas, when we invest 30s. in a ton of straw, we receive 1,000lbs of digestible aliment.

This estimate of the relative value of oat straw and oil cake, the lecturer contended, was rather under than overstated in favor of the former; inasmonia sno account was taken of the thirty per cent. of the so-called indigestible woody fibre, which he believed was in great part assimilable under ordinary circumstances, and could be rendered nearly altogether digestiblo by proper treatment.