New York Agricultural Experiment Station.

(These series of frequent reports are intended to inform the public of progress at the Station rather than to give complete results.)

BULLETIN NO. VI—NEW SERIES.

N. Y. AGRICULTURAL EXPERIMENT STATION,
GENEVA, N. Y., Nov. 5, 1885.

HAY VS. DAMAGED HAY.

In 1884 some clover hay rowen was exposed to the weather for about a month. It was then brought to the laboratory and carefully sorted into two samples, the one representing an average sample, the other (in appearance) the poorest portion.

The analyses of the hay are given below:—

	No. 1. Original hay.	No. 2. After one mos. exposure.	No. 3. Poorest portion of No. 2.
Ash	7.37	4.85	5.43
Albuminoid (N. x 6.25)	13.81	12.19	13.87
Crude fiber	33.02	41.11	40.71
Nitrogen—free extract	41.93	38.95	37.03
Fat (ether extract)	3.87	2.90	2.96
	100.00	100.00	100.00

As a general rule, the albuminoid constituents of an analysis is representative of the food value. According to this rule, there is a loss shown in No. 2, and superior quality in No. 3. The loss in the ash element is marked. Upon the whole, were these analyses shown

without any other information than that they were of clover rowen, it is probable that the poorest portion of the exposed sample would be selected as the best.

The hay was offered to the cows, and while No. 1 was eaten readily, Nos. 2 and 3 were absolutely rejected, showing that the animals at least did not accept the result of the chemical analysis.

It seemed impossible to believe but that some change had been effected in the hay, whereby quality was lost, notwithstanding the total albuminoid constituent showed little retrogressive change. Hence, Mr. Ladd applied the test of artificial digestion, the various samples being exposed alike to the action of a digestive fluid made up from commercial scale pepsin. The knowledge thus gained placed the hays in their relative positions, and showed that a change in the albuminoid constituent had taken place in the exposed hays, and that Nos. 2 and 3 were far inferior in feeding value to No. 1.

The figures gained were as below:—

No. 1. CLOVER ROWEN HAY.

Total albuminoid, per cent	13.812
Per cent. digested	10.187
Per cent. undigested	3.625
Per cent. of digested to total or digestion coefficient	73.755

No. 2. SAME, EXPOSED ONE MONTH. AVERAGE SAMPLE.

Total albuminoid, per cent	12.187
Per cent. digested	5.995
Per cent. undigested	6.192
Per cent. of digested to total or digestion coefficient	49.232

No. 3. SAME, EXPOSED ONE MONTH. POOREST PORTION.

Total albuminoid, per cent	13.843
Per cent. digested	6.750
Per cent. undigested	7.093
Per cent. of digested to total or digestion coefficient	488761

We hence see that in nutritive value as measured by the albuminoid digested, the No. 1 sample gave 73.75 per cent. of its albuminoid to the digestion fluid, while the exposed samples, No. 2 and No. 3, gave but 49.23 and 48.76 per cent. While of the total albuminoid the hay No. 1 had but 3.62 per cent. unavailable, the exposed samples, No. 2 and No. 3, had 6.19 and 7.09 per cent. undigestible.

This experiment seems a good illustration of the injury which may accrue to hay by exposure to the elements, and serves to indicate that something more than chemical analysis is required for the study of our cattle foods.

We would also call attention to the apparent value of the system of artificial digestion for determining the food value of our feeding stuffs, and which, supplementing the data obtained through chemical analysis, tends to give correct information which can find application in practical use.

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