

	Ensilage Immature Maize.	Ensilage Mature Maize.	Field Cured Maize.
Dry matter.....	198.9	295.8	270.2
Albuminoids.....	14.4	21.0	11.9
Crude fibre.....	61.6	76.3	91.7
Nitrogen-free extract.	104.1	170.8	159.1
Fat.....	10.9	15.2	13.8

So far as our investigation has been carried the results are in favor of ensilage from maize well advanced towards maturity, and we feel confident that the ensilage of the future will be from maize that has the corn glazed.

In closing I wish to thank W. H. Whalen, assistant chemist, and R. D. Newton, laboratory attendant, for their incessant fidelity in all the details of this investigation.

New York City, September 15, 1890.

*Since this article was read Mr. Ladd has been appointed Prof. of Chemistry in the Dakota Agricultural College, Fargo, N. Dakota, and Director of the Experiment Station.—*Ed.*

STUDIES UPON RESINS.*

BY L. H. FRIEDBURG, PH. D.

II.

In order to determine exactly the temperature of melting kauri gum and the vapors arising from the same, simultaneously, the following experiment was performed, in which I was assisted by Professor A. H. Sabin, in whose laboratory the work was done.

222 grms. of coarsely powdered kauri (copal) gum, very pale but rather soft, known in the New York market as "four cross" gum, was put into a retort 125 m.m. in diameter and 125 m.m. deep from the bottom of the bulb of the retort to the lower side of the throat.

Through the tube were inserted two thermometers (mercury un-

*See J. Amer. Chem. Soc., **12**, 285, and foot note, 287.

der nitrogen), in the following way. One reached 190 mm. below the upper end of the cork, and had its bulb just covered by the gum. The cork covered the space from + 110° to + 130° C and the 315° point was 230 m.m. above the cork. The other reached 95 m.m. below the cork, thus having its bulb in the vapor. The cork covered the graduation from + 38° C. to + 57° C., the 180° C. point being 150 m.m. above the cork. With shorter thermometers the temperatures recorded would have been higher, and in the case of the extreme temperature reached, 351° C., would probably have been 15° or 20° higher if the thermometer could have been immersed in the liquid. The temperatures observed were as follows :

	<i>Vapor.</i>	<i>Gum.</i>
After 5 minutes	115° C.	—
10 “	149 “	—
15 “	163 “	166° C.
20 “	166 “	210 “
25 “	152 “	260 “
30 “	168 “	269 “
35 “	174 “	293 “
40 “	173 “	297 “
45 “	166 “	327 “
50 “	167 “	343 “
55 “	181 “	351 “
60 “	178 “	341 “
65 “	175 “	337 “
70 “	175 “	335 “

The burner was removed 23 minutes from the beginning of the operation and replaced 5 minutes later. For the first 18 minutes the retort was filled with visible fumes, which only partly condensed in the attached Liebig's condenser. They then disappeared and the upper half of the retort remained transparent until the close of the operation. The liquid distillate obtained in this case weighed only 36 grms. The residue in the retort was poured hot into a metallic vessel, shallow and wide, and allowed to cool. It was then transparent, clear and of a brilliant, dark amber color. It proved to be completely soluble in cold spirits of turpentine.

The distillate consisted of two layers, the lighter forming about 80 per cent. of the whole and showing a spec. grav. of 0.86 at + 21°C. The heavier liquid had a specific gravity near 1.01 at the same temperature.

College of the City of New York, October, 1890.

THE INFLUENCE OF TARTRATES AND LACTATES UPON THE DIGESTION OF ALBUMINOIDS.

BY LUCIUS PITKIN, PH. B.

In the digestion of albuminoids the chief agent is the gastric juice: upon its composition as regards strength in acid and in the amount of pepsin present depends the rapidity of its action and the completeness of the change it induces in the conversion of albuminoids into peptones.

It is obvious, therefore, that any chemical compound dissolved in the gastric juice which either modifies its acidity or influences by its action the pepsin itself will exert a corresponding effect upon gastric digestion.

Prof. Chittenden of Yale University has published (*Philadelphia Medical News*, February 16, 1889) data concerning the retarding influence of many chemical substances on the peptic digestive process. It may be stated as a general rule with but few exceptions that in experiments with hydrochloric acid pepsin solution the addition of soluble salts exercises an inhibitory action on the conversion of albuminoids into peptones.

Not only is a certain acidity necessary for the best digestive action, but the character of the acid is even more important than the strength. Hydrochloric acid, the natural acid of the gastric juice is, as many experimenters have shown, the most powerful of the acids in its proteolytic action when combined with pepsin. As a generalization from the experiments recorded it may be remarked that the mineral acids have been found to favor diges-