FODDER.

SILAGE TRIALS CONDUCTED AT THE JAFFNA EXPERIMENT STATION.

DURING THE SEASONS 1923-24 AND 1924-25.

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The objects of the trials were:-

(a) To demonstrate the possibilities of ensilage as a reserve food for cattle in the Jaffna Peninsula throughout the dry season.

(b) To compare the relative feeding values of ensilage produced from various crops.

TRIAL 1923-24.

A simple form of pit or trench silo was used. A trench 16 feet in length, 7 feet in width and 5 feet in depth was excavated and prepared by lining the sides with palmyrah mats. A cadjan roof was erected overhead so as to prevent the entrance of rain water. In form, the pit was slightly wedge shaped with the ends cut away, so as to form easy gradients for the passage of cattle employed in compressing the chopped green stuff used in the preparation of ensilage. A crop of Periamanjel Cholam, ¾ acre in extent, was cut when in ear and, unfortunately, past the milky stage. It was passed through a hand-chopping machine and the trench silo gradually filled with the chopped material—care being taken that the mass was well pressed down at the corners so as to exclude as much air as possible. The filling and compacting process occupied two days after which the mass was covered with a layer of two feet of earth and left for a period of five months. The temperature of the mass was tested from time to time with iron rods and it was found that much heat was generated during the early stage. The trench was filled on January 10th and 11th, 1924, and was opened on June 24th. It was then found that the mass had contracted by 1 ft. 6 inches and that the top 3 or 4 inches of ensilage was dark-brown in colour and odourless. The bulk of the ensilage was slightly moist, of a pale greenish colour, and possessed a pleasantly aromatic smell. The ensilage was used as part of the ration for six of the coast bulls for a period of one month—each bull receiving 35 lbs. per day. The bulls, after a few days, began to relish this new food and appeared to thrive on it.

The total quantity of cholam used in the preparation of ensilage	17,703 lbs.
The total quantity of ensilage fed ...	6,052 ,,
The total quantity of refuse	421 ,,

It was found that a good deal of wastage had occurred due to Termites and rats.

Report on a sample of the Cholam Ensilage sent to Mr. A. Bruce, Government Agricultural Chemist, for analysis.

Analysis : Total weight as received	555	Gms.
After drying in the sun	318	,,
Water lost in the sun	237	,, = 42·7 %

	Cholam Silage dried @100°C	For comparison Silage green Oats & Tares dried at 100°C	Cholam Silage on the Original
Crude Protein & Ether Extract &	4·87 % / 2·47 %	12·61 % / 3·21 %	2·36 % / 1·20 %
Nitrogen free extractives	48·36 %	47·62 %	23·50 %
Crude Fibre	35·00 %	27·87 %	17·00 %
Ash	9·30 %	8·69 %	4·52 %
True Protein	4·77 %	5·76 %	2·30 %
Amides (as NH3)	0·11 %	6·85 %	0·05 %
Nitrogen	0·78 %	2·02 %	0·38 %
Water Extract	23·10 %	..	10·74 %
Ammoniacal Nitrogen	0·037 %	..	0·017 %
Nutritive Ratio	1 : 11·19	1 : 4·4	1:11·2
Food Units	66·71	87·17	32·4

& Not taking Volatile Organic Acids of silage into account.

100° *Dried*

Volatile Organic Acids	c. c.N.	c. c.N.
Non-volatile Organic Acids	32 8	304·2
Amino Acids	67·1	761·5
Volatile Bases	14·2	437·8
Dry Matter	71·3	92·8
	1000 Gms.	927·5

100° *Dried*

Total Acidic groups, free & Combined	114·1
Amino acids & Amides of Asparagine type	14·2
Total Organic acids of lactic & acetic type	99·9
Organic acids volatile in steam	32·8
Non-volatile Organic acids	67·1
Volatile bases	71·3

For purposes of comparison I have included silage made from Green Oats and Tares. It will be seen that the Nutritive Ratio is broad in the case of the Cholam and there are less Food Units present.

The Cholam Silage is worth trying as a feeding material.

TRIAL 1924-25.

The same trench silo was used as in the previous year—but with modification. The walls and floor of the trench were lined with stone work 6 inches thick made into a rough concrete. The total cost of construction including excavation and lining was Rs. 82/- A crop of Periamanjel Cholam ½ acre in extent was specially grown—thickly sown—and was cut at the milk stage. The material was treated in the same way as in the previous trial and the trench filled by December 20th, 1924. It was opened on April 23rd, 1925, and the ensilage fed to the bulls for 21 days at the rate of 50 lb. per head per day. The animals appeared to improve in condition as a result of this feeding.

The total quantity of cholam used in the preparation of ensilage	8,709 lb.
The total quantity of ensilage fed	6,592 ,,

There was practically no wastage.

The following is a report on a sample of the Cholam Ensilage sent to Mr. A. W. R. Joachim, Government Agricultural Chemist, for analysis :—

The sample cannot be described as a " good " one, decomposition of the nitrogenous matter with the production of maladorous compounds having taken place. The results of the analysis of the " dry matter " of the silage show that Cholam Silage compares favourably with silage made from other cereals, etc., e.g. oats and tares so far as ether extract, ash, protein and carbohydrate contents go; but the acid contents are distinctly low. This is because of the putrefaction that had taken place and the consequent neutralization of any acids by the nitrogenous bases formed..

Analysis of Silage—on sample as received :-

Moisture and Volatile acids	% 36·30
Dry matter	% 63·70
	100·00
Dry matter	
Crude protein	12·13
Ether extract	4·04
Nitrogen-free extractives	46·73
Crude fibre	30·90
Ash	6·20
	100·00
Nutritive Ratio on above analysis	1 : 46
Food values	83·92
Volatile acids (calculated as Acetic Acid) on Dry matter	·15%
Non-Volatile Acids (as Lactic acid) ,,	1 ·6 %

Trials were also made with a fodder variety of Cluster Beans (*Cyamopsis psoralioides*) and with Giant Sun-flower (*Helianthus annus*) from 1 and ¼ acre plots respectively—3,450 lb. of the former and 4,021 lb. of the latter being prepared in a similar way. When, however, the silo was opened it was found that the materials—particularly the Cluster Beans—were in a state of more or less complete decomposition and were quite unfit as food for cattle. The early somewhat make-shift trials served to show that bulky crops of fodder, preferably fodder cholam, grown during the wet season, can be preserved for use at a time when cattle are beginning to lose condition owing to the growing scarcity of food. The results indicate that the simple and inexpensive type of Silo such as the trench silo is the best suited for Jaffna conditions, and the Director of Agriculture has authorized to make provision on the Jaffna Experiment Station of two trench silos for further experimental work. Much has been done in India with silage and further experience is necessary for Ceylon.