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L. C. Snook

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# PRESERVATIVES AND THE NUTRITIVE VALUE OF SILAGE

By L. C. SNOOK, D.Sc., Animal Nutrition Officer

**I**NQUIRIES are being received concerning the value of using preservatives such as sodium metabisulphite when making silage. Encouraging reports have been published overseas concerning the effectiveness of this chemical in reducing waste and increasing the palatability of silage. The following comment is copied from the *Journal of the Royal Agricultural Society of England* (Volume 117, page 136, 1956).

"During the process of making silage by the conventional method losses of nutrients are incurred by respiration of the plants after cutting. These losses continue in the silo as long as the air entrapped in the mass of ensiling material contains oxygen. Thereafter bacteria become active, with organic acids produced as the principal end product of their fermentative actions. Together, these respiratory and fermentative transactions entail a considerable loss of nutrients even when conditions for silage making are ideal. They are appreciably reduced when metabisulphite is used.

"Metabisulphite acts essentially as a preservative and if it is to be fully effective the silo should be filled rapidly, the contents should be efficiently packed, and the material being ensiled should be short. Under these conditions respiration and bacterial activity are reduced, acid production is low and the resultant silage is much closer to neutrality than conventional types of silage. In most samples of metabisulphite silage no butyric acid is detectable, and in others the amounts are very low."

Many experiments have been carried out to determine just how effective are various preservatives when added to silage. The following table (from the *Journal of the R.A.S.E.*) indicates the losses which can occur without preservative and when sodium metabisulphite or molasses are added to material in properly-constructed tower silos.

LOSSES OF NUTRIENTS FOR SILOS FILLED WITH UNWILTED HERBAGE, DIFFERENT METHODS OF ENSILING BEING USED.

Herbage and Method of Ensiling.	Loss of		
	Dry Matter.	Crude Protein.	Energy.
Grass—	per cent.	per cent.	per cent.
8lb. SMB per ton ....	8.9	7.4	9.0
No preservative ....	11.3	9.6	8.7
80lb. molasses per ton ....	21.7	21.7	27.3
Lucerne-grass—			
7½lb. SMB per ton ....	12.3	26.3	10.0
10½lb. SMB per ton ....	7.6	18.6	6.8
No preservative ....	30.6	34.7	28.2
70lb. molasses per ton ....	17.5	33.0	14.5
Lucerne—			
9lb. SMB per ton ....	14.8	18.4	12.9
No preservative ....	28.4	27.4	25.8

SMB = sodium metabisulphite.

It is apparent that the preservative does reduce loss when used in a well-made air tight silo. The magnitude of the saving is not necessarily great, however, and may be of no consequence in stack or pit silage.

Sodium metabisulphite costs about 3s. per pound in Perth. As about 8 lb. are required per ton of silage, the use of the preservative can add considerably to the cost of the conserved fodder. The sulphite has to be thoroughly mixed with the green material being ensiled. This also will increase the time and labour required to make silage. Under present conditions, therefore, it is most unlikely that the use of sodium metabisulphite in silage making will be justified.