

# Effect Of Different Levels Of Molasses On Quality Of Silages

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## Abstract:

Cowpea, a leguminous crop. It is rich in crude protein and contains relatively low fermentable carbohydrates. This results in poor quality silage with decreased lactic acid fermentation and slow drop in pH (Basole 1994). During present investigation silage was made from chopped foliages of cowpea treated with molasses at different levels like 0, 5% and 10%. The moisture content in chopped and treated silage material ranged from 74.7 to 78%, titratable acid(TA) showed higher values (76.8 to 82 ) indicated higher acid fermentation.

Chemical composition of silages, indicates that treatment of cowpea foliages with fermentable material like molasses up to 10% level enhance lactic acid production with rapid drop in pH ,which is ultimately associated with preservation of nutrients and conservation of cowpea in a better way.

**keywords :** silage, molasses ,cowpea

## introduction :

In view of demand for fodder in bulk, great importance is being laid on the involvement of high yielding, short duration and nutritive varieties of fodder crops. As a result there is a glut of fodder during the peak periods of growth and scarcity during other periods , particularly in summer. The most practical solution of such fodder scarcity during summer lies in conserving supplies of green fodder available during favourable season, so as to use it during scarcity period . preparation of silage is a good method for conservation of green fodder wherein the crop nutrients are properly preserved and the resulting products offer a nutritious and palatable feed to livestock.

Conservation of fodder as silage was recommended by Pirie (1971) with these background work of silage was undertaken at several places in India it has been shown by several workers that leguminous foliages are not so good for preparing silages as they contain less fermentable carbohydrate and more buffering constituents like protein. On the other hand non-leguminous foliages contain high proportions of fermentable carbohydrate with low buffering capacity and hence silage resulting from them are of better value . In addition it was also noticed that the foliages treated with molasses or urea + molasses were found to be beneficial for good quality silages. Hence the present investigation is carried using foliages of cowpea ; a leguminous crop which is chopped and pretreated with different levels of molasses like 0 ,5% and 10% on the basis of fresh weight of the silage material before ensiling.

## Materials and methods :

Effect of silage additives on the quality of silages of cowpea studied using cowpea foliages. They are harvested at pre flowering stages and immediately brought into the laboratory chopped and pretreated with molasses at different levels ( 0, 5% and 10% of fresh weight of the silage material ) before ensiling. at pre flowering stages and immediately brought into the laboratory. The vegetation was chopped into 2-3 cm pieces and used for preparation of silage.

The chopped material was placed in a plastic container (18.5 × 10cm) and pressed, making it compact and excluding air. The container was capped and sealed with wax. These containers or 'laboratory silos' were left at room temperature in the dark until used. After 45 days of ensiling the boxes were opened and physical characteristics i.e. colour, texture, odour etc. of resulting silages were examined. A sample of 40 gms, fresh silage was mixed with 40ml distilled water, placed on cotton cloth, pressed and the juice was collected in a beaker. The pH was measured using glass electrodes. To determine titratable acidity (TA), 5 gms of fresh silage was mixed in 75 ml distilled water; boiled for a few minutes, filter through cotton cloth, diluted to 100 ml and titrated against 0.1N NaOH using phenolphthalein indicator. Total volatile fatty acids (TVFA) were estimated by steam distillation method as described by Chaudhory (1970). Buffering capacity (BC) was determined following Playne and McDonald (1966). Lactic acid was estimated using the method of barker

and Summerson (1941) as described by Oser (1979). Another sample of silage was dried in an electric oven, at 95±5 degree centigrade till constant weight. The dry samples were ground to a fine powder and used for subsequent analysis.

Dry matter and moisture content in the sample were measured by considering loss in weight during drying. The measurement of water soluble reducing sugar (WSRS) in terms of glucose was done using folin-Wu-tubes Oser (1979). The Nitrogen content was determined by microKjeldahl method and CP was expressed at N×6.25 (Bailey,1967). A. O. A. C. (1970) method was followed for the estimation of crude fat (Ether Extract), ash, acid insoluble ash (AIA), Nitrogen free extract (NFE), total carbohydrate (TC) and Calcium (Ca) along with crude fibres (CF) and phosphorus (P).

### Results and discussion :

Practically molasses cannot be used as a sole / major feed but it has immense value when a small amount of it is used as an appetizer to induce stock to consume abundantly available unpalatable foliages. During present investigation silage was made from chopped foliages of cowpea treated with molasses at different levels viz 0 ,5% and 10%. The results obtained are presented in table 1 and 2 . The moisture contained in chopped and treated silage material ranged from 74.7 to 78 ,Titratable acid (TA) showed higher values (76.8 to 82 )indicated higher acid fermentation.

The buffering capacity (BC )varied widely. The untreated silage showed higher value of PH (5.75) but it should rapidly fall in pH to 4.15 and 4.09 due to 5% and 10% molasses respectively . The results were comparable to that reported by Basole (1994) . Lactic acid production also increased from untreated silage sample to treated silage

(2.80 to 5.10) indicating lactic acid fermentation due to the addition of fermentable carbohydrate in the form of molasses (Sohane and Chaudhary, 2001). There is little variation in the TVFA which range from 8.0 to 9.8 .However water soluble reducing sugar content increased considerably which may be due to addition of molasses .

On the basis of decreased PH value of buffering capacity and increase lactic acid production it may be concluded that addition of molasses as additive may improves quality and palatability of silage and also helpful as energy source (Sayyed and Gogle ,2000 ,Sengar ,2001) .Chemical composition of silage ( Table 1 ) indicate that the treatment of cowpea foliage with fermentable material like molasses up to 10% level enhance lactic acid production with rapid drop in pH ,which is ultimately associated with preservation of nutrients and conservation of cowpea in better way.

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Table 01

Chemical compositions of silages made from chopped Cowpea foliages pretreated with molasses.

Crop	Treatment level	Moisture (%)	Titrate acidity m.equiv/ 100gm DM	Buffering capacity m.equiv/ 100gm DM	pH	Lactic acid (% of DM)	Total volatile fatty acid TYFA M.m/100gm	Water soluble reducing sugar (% of DM)
Cowpea	0	78.0	76.8	32.0	5.75	2.80	9.80	1.10
	5	75.8	80.0	30.0	4.15	5.08	8.0	1.80
	10	74.7	82.0	31.5	4.09	5.10	8.10	1.94

Table 02

Nutrient Content of Silages made from Chopped Cowpea Foliages pre-treated with Molasses.

Crop	Treatment level	% dry matter DM	% of dry matter (DM)								
			Crude protein (CP)	Crude Fibre (CF)	Ether Extract (EE)	Ash	ASA	NFE	TC	Ca	P
Cowpea	0	22.0	15.6	34.0	2.31	9.6	8.12	38.5	72.5	1.69	0.30
	5	24.2	15.4	33.6	2.27	8.7	7.40	40.0	73.6	1.63	0.32
	10	25.3	15.7	34.2	2.10	9.1	7.90	38.9	73.1	1.70	0.29