

Chop Length, Dry Matter and Density of Corn and Wheat Silage Structures in California Dairies

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OBJECTIVE

The objective of this study was to describe chop length, dry matter and density of corn and wheat silage structures in California Dairies.

METHODS

- Three **density** samples were taken at six ft from the bottom of the silage structure and two samples at six ft from the top. Density samples were obtained with the Dairy One core density sampler. Density was expressed as dry matter (DM) and as fed (AF). As fed density indicates porosity (resistance to air penetration) and may be a better indicator of silage preservation than DM density. Densities were compared with paired t-test (T and B) and chi-square test (DM and AF).

- Dry matter** from the density core samples was determined with a microwave oven.

- Chop length** of forage was visually determined using a measuring tape.

RESULTS: Chop Length and DM

Chop length of corn and wheat silage

Chop Length	1.3 cm	1.6 cm	1.9 cm	2.2 cm
Corn Silage (n)	6	1	14	4
Wheat Silage (n)	6	0	9	1

Dry matter of corn and wheat silage

	Dry Matter (%)		
	Top ¹	Bottom ²	Overall ³
Corn Silage	37.0	35.4	35.7 (27.0 - 42.0)
Wheat Silage	35.5	35.3	32.9 (26.3 - 38.2)

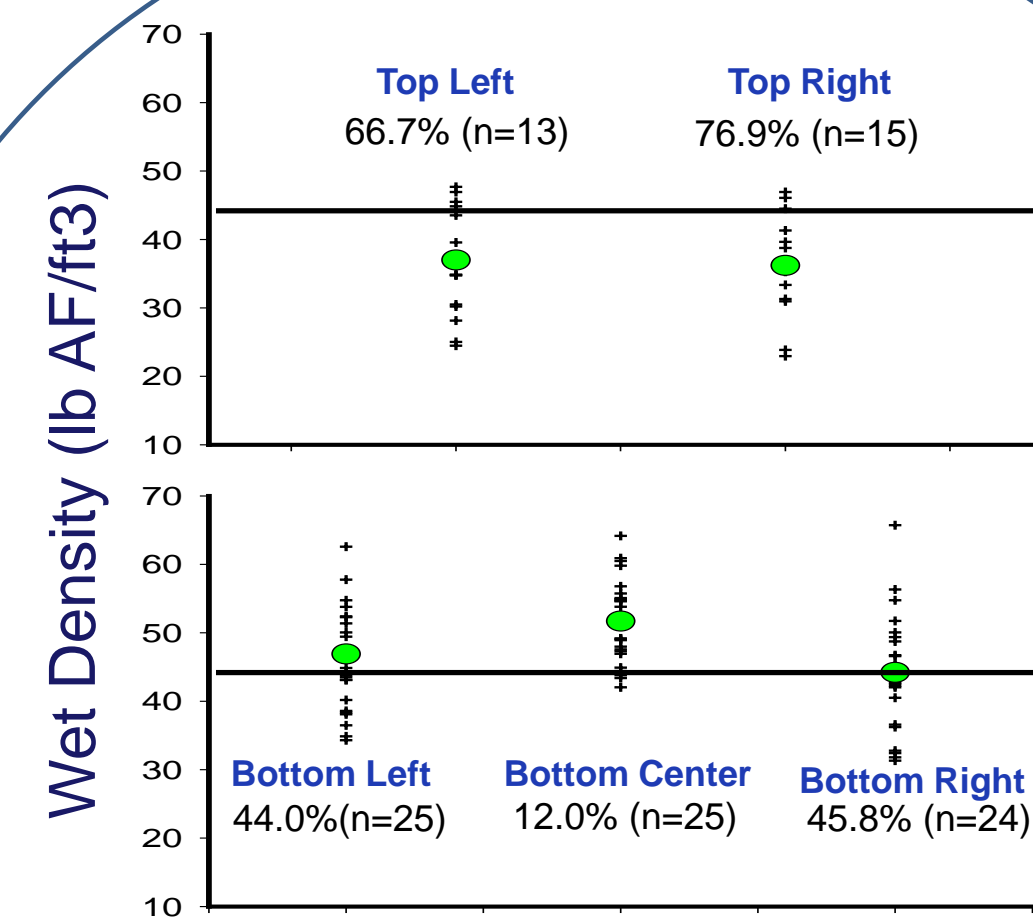
¹Mean of two samples taken 6 feet from the top of the silage.

²Mean of three samples taken 6 feet from the bottom of the silage from those silage structures which a top sample.

³Mean and range of the overall silage density.

RESULTS: Density

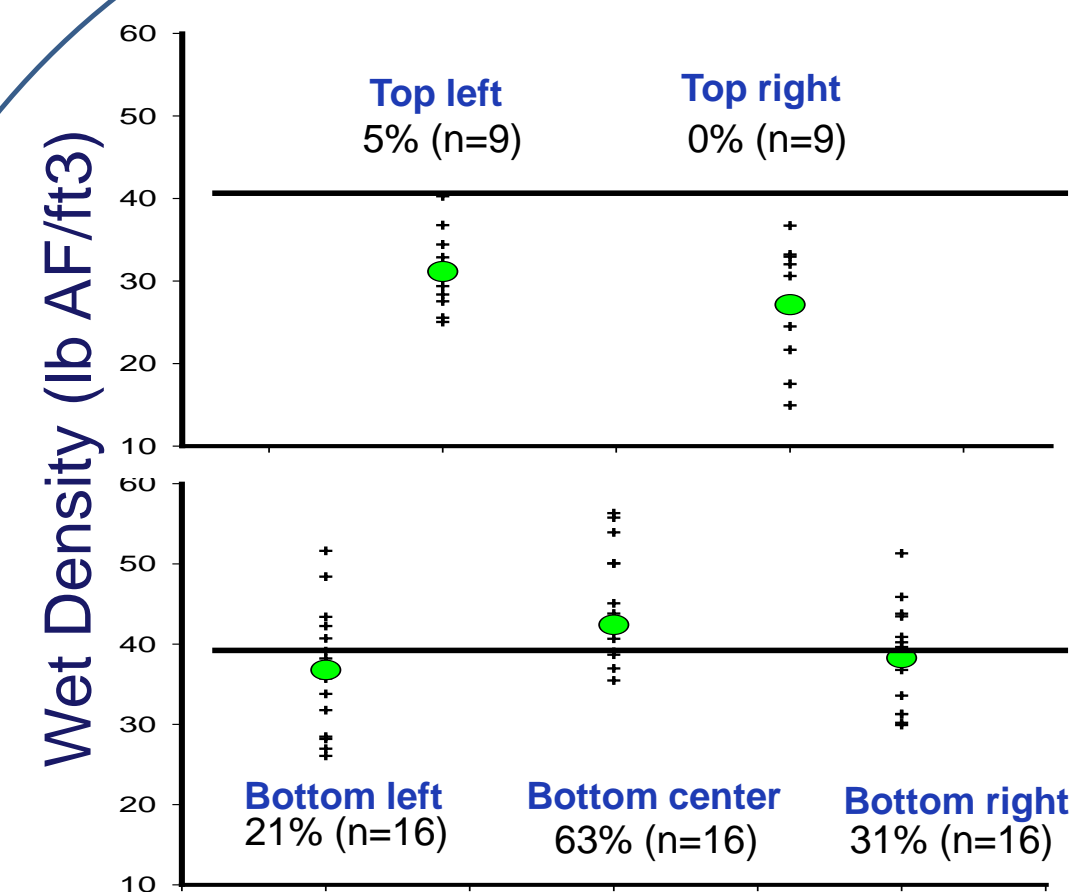
CORN



¹Proportion of samples below the desired benchmark of 44 lb AF/ft³.

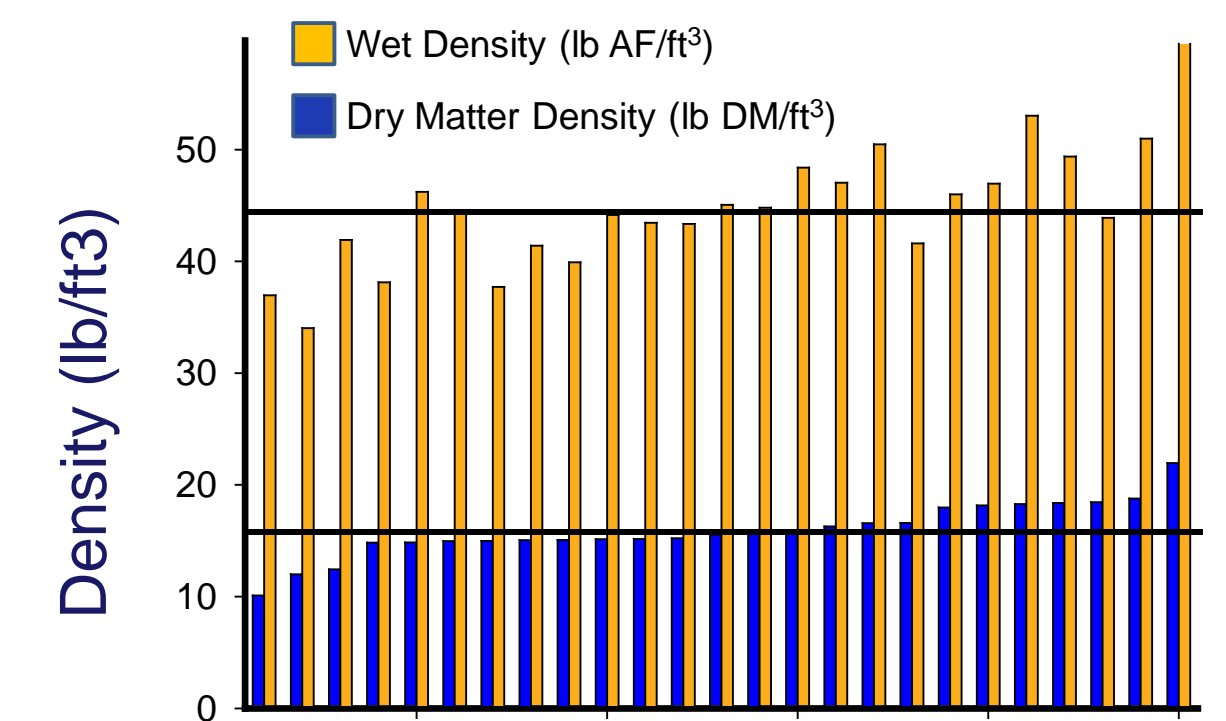
The density of corn silage structures was higher at the bottom than at the top (47.6 vs. 36.6 lb AF/ft³; $P < 0.001$). Corn silage structures (88.0%) had at least one density sample below 44 lb AF/ft³, and 60.0% below 35 lb AF/ft³.

WHEAT

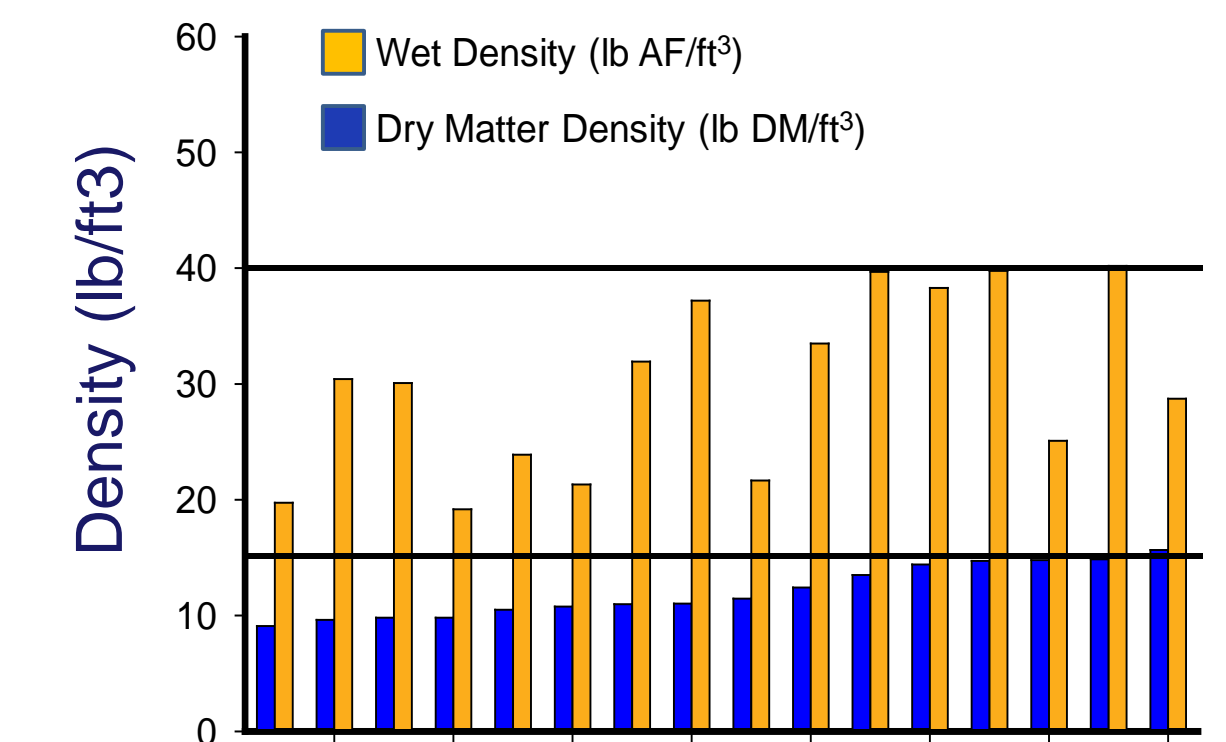


¹Proportion of samples below the desired benchmark of 40 lb AF/ft³.

The density of wheat silage structures was higher at the bottom than at the top (40.0 vs. 29.1 lb AF/ft³; $P < 0.001$). Wheat silage structures (87.5%) had at least one density sample below 40 lb AF/ft³, and 68.7% below 30 lb AF/ft³.



A greater ($P < 0.001$) proportion of corn silage structures met the desired density benchmark when expressed as DM (88.0%; 15 lb DM/ft³) than AF (44.0%; 44 lb AF/ft³).



There were no differences in the proportion of wheat silage structures meeting the desired density benchmark as AF (18.7%; 40 lb AF/ft³) or as DM (31.2%; 14 lb DM/ft³).

SUMMARY

The units (DM or AF) and sample location (B and T) need to be accounted for when interpreting silage density results. There are opportunities to improve silage packing density in California dairies.

