

Effect of NaOH treatment and of mean particle size on ruminating index of wheat straw in all-concentrate diets for finishing cattle

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Feeding completely pelleted diets results in efficient weight gains of finishing cattle. However, physical (grinding) and chemical (NaOH) treatments of the incorporated roughage or roughage substitutes can markedly reduce chewing activity. The purpose of these trials was to determine the relative ruminating indexes of ground and/or NaOH-treated wheat straw.

Four different experiments were carried out with the same lot of 6 2-year dairy heifers. The basal diet contained 45 % corn cobs. In each experiment, one of the following ingredients was progressively substituted for the corn cobs at ratios of 0 %, 15 % and 30 % : non treated finely ground straw (A), non treated coarsely ground straw (B), NaOH-treated finely ground straw (C), and NaOH-treated coarsely ground straw (D). The pelleted diets (10.5 kg DM/d) were distributed according to a Latin square design in each experiment (3 diets, 3 periods, 6 animals). Ruminating time was recorded by an automatic system consisting of strain gauge transducers linked to a computerized data acquisition system. Between ingredients, the ruminating indexes were compared by variance analysis. Furthermore, the 4 ingre-

dients were incubated together in an animal fitted with a ruminal cannula for *in situ* degradability.

The NaOH-treated straw gave significantly lower ruminating time indexes (table I), which agrees with the results reported by Dulphy *et al* (1982). Longer mean particle size significantly increased ruminating time with treated and non treated straw. *In situ* degradability of the straw showed unreliable results, which may be explained by the small particle size of the ingredients. Consequently, it was not related to the ruminating time indexes. The results indicate that the ruminating time index of straw depends on its particle size and its resistance to being degraded. Other parameters have yet to be clarified, such as the minimum duration of ruminating activity which still assures physiological conditions in the rumen of fattening cattle.

Dulphy JP, Breton J, Bienaimé A, Louyot JM (1982) *Ann Zootech* 31, 195-214

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Table I. Particle size, *in situ* degradability and relative ruminating indexes.

	A	B	C	D
Mean particle size, μm	561	1 006	650	866
<i>In situ</i> DM degradability, %	41.0	39.3	43.1	54.0
Relative ruminating indexes*	100.0 ^{ab}	206.4 ^{ade}	25.2 ^{bce}	84.0 ^{cd}

* Diet (A) = reference. On same line, means with common superscript are different : ^{a,b,c} : $P < 0.05$; ^{d,e} : $P < 0.01$.