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Effect of sterilization by autoclaving of maize and sugarcane bagasse cell walls on chemical and biological susceptibility. I Giraud, G Fonty, JM Besle (*INRA, Station de Recherches sur la Nutrition des Herbivores, Centre de Clermont-Theix, 63122 Saint Genès-Champanelle, France)*

Autoclaving roughages decrease lignin content and changes biodegradability [1]. Since sterilization by autoclaving is a routine process, the aim of this work was to assess if autoclaving affects cell wall composition, bioavailability and, in particular, cell wall-phenolics degradation.

Cell wall residues (CWR) of maize (cv LG11, silage stage) and sugarcane bagasse were prepared [2]. They were autoclaved (120°C, 20min) in quadruplicate with water in Balch tubes, filtered and dried (60°C for 48h). The UV spectrum was measured on the filtrate. Initial CWR and residues were hydrolysed with 1M NaOH (20h, 20°C), then phenolic acids and the saponified residues (SRs) were determined [2]. In addition, the cellulase dry matter digestibility (CDMD) was determined [3]. After autoclaving, losses in dry matter were only 0.9 and 2.2% for maize and sugarcane bagasse CWR respectively (Table 1). The losses in *p*-coumaric acid (PCA) and ferulic acid (FA) were slight and not significant for both substrates. Compared to that of the control, the UV spectrum showed a peak at 280nm and a shoulder at 315nm, corresponding to the solubilization of phenolics. When calculated against a ferulic acid standard, the increase of the absorbance at 280nm corresponded to about 2% of the initial phenolics. Alkali-solubility slightly increased by 1.3 and 1.7% for maize and sugarcane bagasse CWR respectively. The CDMD was 16.1 and 8.4% for maize and sugarcane bagasse CWRs, respectively and only increased by 1.4% for maize CWR.

It was concluded that the solubilization of DM, of phenolics, and the changes in alkali- and in biological susceptibility were very small under the usual conditions of sterilization by autoclaving. It is thus not necessary, at least for the poorly degradable substrates, to use a method such as ethylene oxide, which is non-destructive but less convenient.

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Chemical susceptibility and cellulase digestibility of CWR after autoclaving

		Phenolic acids (g kg^{-1} residue)		*SR (g kg^{-1} residue)*	*CDMD (%)*
		PCA	*FA*		
Maize CWR	initial	25.8 ± 0.3	6.4 ± 0.1	50.2 ± 0.2	16.1 ± 0.3
	autoclaved	26.6 ± 0.1	6.3 ± 0.1	48.9 ± 0.1	17.5 ± 0.1
Bagasse CWR	initial	18.1 ± 0.7	3.3 ± 0.2	67.6 ± 0.2	8.4 ± 0.3
	autoclaved	18.9 ± 0.7	3.8 ± 0.1	65.9 ± 0.1	8.3 ± 0.1