The nutritional value of corn grains for growing pigs: infuence of the way of preservation

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Corn can be harvested at a greater percentage of moisture and used in animal feed as a high-moisture corn (whole or grounded grains). The aim of the trials is to assess the impact of preservation practices of high-moisture corn grains compared with dry corn grains on faecal and ileal digestibility of various nutrients in growing pigs

Material & Methods

Faecal digestibility trial	Ileal digestibility trial
Corn harvested and stored in 3 forms : Dry Corn grains (**DC**), High-Moisture Whole Corn grains (**HMWC**) & High-Moisture Grounded Corn grains (**HMGC**)	
Corn (96%) + minerals & vitamins (4%) - Wet meal	Corn (94,5%) + minerals & vitamins (5,5%) - Wet meal
15 castrated male pigs (5 per diet)	4 Surgically modified pigs – latin square
Adaptation : 9 days + Collection : 3 days	Adaptation : 5 days + Collection : 2 days
Fecal energy digestibility	Ileal energy digestibility + Standardised Ileal Digestibility of Amino Acids (aa DIS)

Results

Digestibility of various nutrients of DC, HMWC and HMGC in growing pigs

	DC	HMWC	HMGC	RSD	ANOVA
Faecal digestibility (%)					
Proteins	79,2 [b]	82,7 [a]	84,4 [a]	1,5	***
Energy	85,2 [b]	85,7 [b]	88,4 [a]	1,3	**
Crude Fat	51,3	52,2	80,5	-	-
Digestible Energy (kcal/kg DM)	3854 [b]	3907 [b]	4019 [a]	59	**
Apparent ileal digestibility (%)					
Organic Matter	79,9 [b]	83,7 [a]	85,4 [a]	1,4	**
Energy	77,3 [c]	80,8 [b]	83,8 [a]	1,5	***
Starch	96,5 [b]	98,3 [a]	99,0 [a]	0,8	**
Crude Fat	57,1 [c]	71,7 [b]	84,9 [a]	6,1	***
Digestible Energy (kcal/kg DM)	3512 [c]	3667 [b]	3831 [a]	67	***

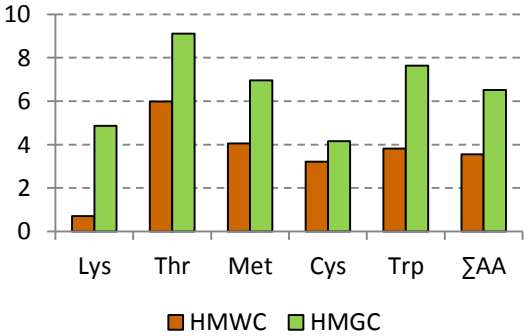
ANOVA : impact of preservation practices of corn grains;
**: P<0,05; **: P<0,01 ; ***: P<0,001;*
RSD : Residual Standard Deviation;
a, b, c: letters on a same row define differents means (test of Newman et Keuls, P<0,05) ;
[1] pool of excreta by diet.

↗ Energetic value of high-moisture corn, faecal as ileal
Better digestibility of crude fat and starch

Difference of amino acids Standardised Ileal Digestibility of high-moisture corns (%) - Comparison with dry corn

ANOVA of aa SID (P<0,05)
Thr, Ala, Val, Ile, Leu and Phe : HMGC> HMWC > DC
Met, Ser and Glu : HMGC > HMWC = DC
Lys, Cys sum of AA : HMGC = HMWC = DC

Global improvement of Ileal digestibility of AA



Conclusion

High-moisture preservation of corn, particularly grounded, improves its nutritional value compared with dry corn