

The effect of protease and β -glucanase supplementation on digestibility of protein, fat and fiber in barley-soybean meal based diets by weanling pigs. J. MASCARELL, D. ZIMMERMAN*, M.D. BAUCCELLS & F. PUCHAL. Universitat Autònoma de Barcelona, 08193 Barcelona (Catalonia, Spain) and Iowa State University*, Ames IA, USA.

1 INTRODUCTION

Recent attention has been given to enzymes as gut-active growth promoters able to lead to a partial degradation of endosperm cell walls in feeds, increasing the proportion of the diet digested by the animal. **The aim of this work** was to determine if feeding diets supplemented with protease and/or β -glucanase affects fecal digestibility (F.Dig) of dry matter (DM), crude protein (CP), fat (FAT) and neutral detergent fiber (NDF)

2 MATERIAL & METHODS

80 weanling pigs of 28 days of age (mean BW 6.3 kg \pm .2) were distributed to 16 reps in a 28-d experiment. The experiment was designed as a 2x2 factorial with β -glucanase and protease (ITPSA Barcelona, Spain). The diets were based on barley, soybean meal and dried whey (3150 kcal EM; 1.25% lys; 19% CP). Fecal samples were collected two times a week during four weeks. Cr₂O₃ was used as marker. Pigs were weighted weekly and average daily gain (ADG), average daily feed (ADF) and feed gain ratio (F/G) were calculated.

3 RESULTS

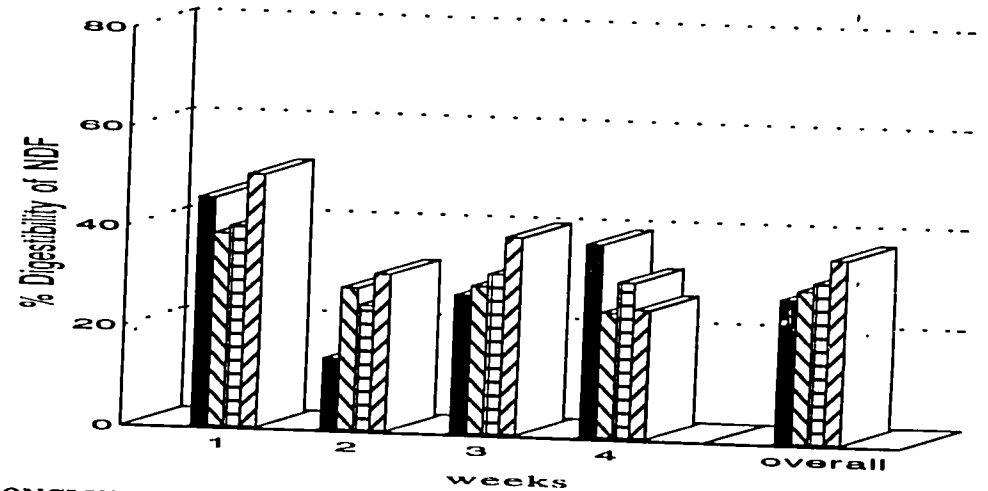
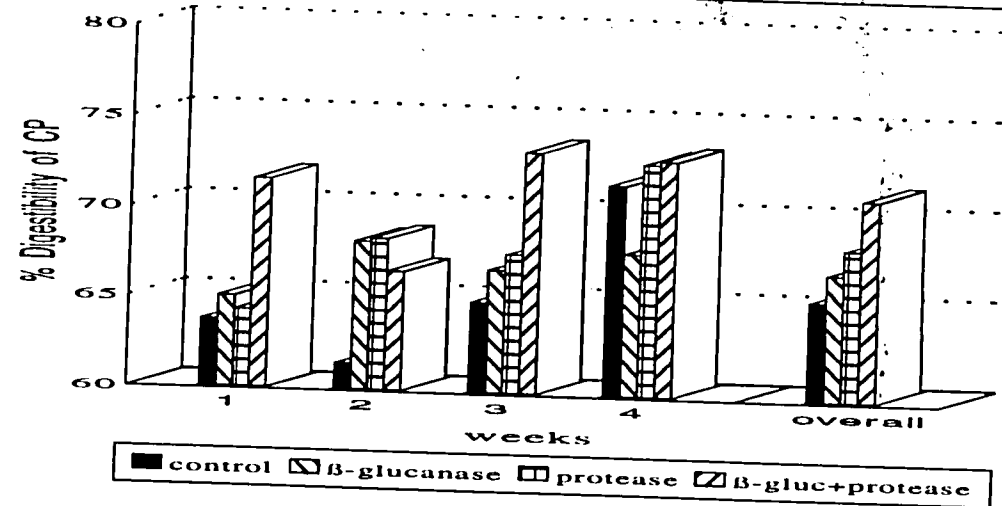
Although no significant differences were found on performance (Table 1), pigs fed with β -glucanase and protease had the highest CP and NDF digestibilities (Graph 1 & 2). Effect of enzymes on DM and FAT were not significant.

Table 1.- Performances and apparent digestibility of the overall period.

Item	control	β -glucanase ¹	protease ²	β -gluca+prote ³ .	SE
0 to 28 d					
ADF, g	790	771	755	778	109,7
ADG, g	459	453	456	457	56,6
F/G	1,72	1,69	1,65	1,70	0,09
F. Dig %*					
DM ^f	64,5	65,7	65,7	67,3	0,09
CP	65,5 ^a	67,0 ^a	68,4 ^a	71,2 ^b	0,05
FAT ^e	46,7	46,5	49,6	51,4	0,1
NDF	28,6 ^c	30,3 ^c	32,0 ^c	36,7 ^d	0,09

(1600 β -glucanase units/kg)¹; (1600 units HUT of protease /kg)²; (1600 units HUT of protease /kg and 1600 β -glucanase units/kg)³. *LS MEANS; ^abTrt (P < 0.02). Age (P < 0.01); ^{cd} Trt (P < 0.01). Age (P < 0.0001); ^e Age (P < 0.0001). ^fAge (P < 0.0001).

Graph 1 & 2.- Effects of β -glucanase & protease supplementation on digestibility of CP and NDF



4 CONCLUSIONS

These data show β -glucanase and protease effects to be additive and to improve F.Dig of CP and NDF. Nevertheless, there would appear to be little justification for the routine inclusion of β -glucanase and protease in weanling pigs diets.