



**HAL**  
open science

## Soya protein antigenicity and small intestinal motility in preruminant calves

Christine Duvaux-Ponter, Jp Lallès, R Toullec

► **To cite this version:**

Christine Duvaux-Ponter, Jp Lallès, R Toullec. Soya protein antigenicity and small intestinal motility in preruminant calves. 7. Conference on Nutrition and Feeding of Herbivores, Mar 1992, Paris, France. pp.151-151, 10.1051/animres:19930225 . hal-00888893

**HAL Id: hal-00888893**

**<https://hal.science/hal-00888893>**

Submitted on 11 May 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## Soya protein antigenicity and small intestinal motility in preruminant calves

C Duvaux-Ponter<sup>1</sup>, JP Lallès<sup>2</sup>, R Toullec<sup>2</sup>

<sup>1</sup> INRA, station de Nutrition et Alimentation, INA-PG, 16, rue Claude-Bernard, 75231 Paris Cedex 05;

<sup>2</sup> INRA, laboratoire du Jeune Ruminant, 65, rue de Saint-Brieuc, 35042 Rennes Cedex, France

In 2 calf feeding trials using 2 batches of the same heated soya product (AHS1 and AHS2, *in vitro* antigenicity Ag 7-8), Lallès and Toullec (unpublished results) showed that AHS1 had high *in vivo* antigenicity (plasma soya antibody titre Ab 7.8) and low nitrogen digestibility (0.61) while AHS2 had low *in vivo* antigenicity (2.8) and higher nitrogen digestibility (0.71). Since preruminant calves sensitive to soya protein develop digestive disturbances associated with gut motility disorders (Sissons *et al*, 1987), the effect of these 2 products on intestinal motility were studied.

After oral sensitization to soya, 3 calves were sensitive (Ab 5.7) and 3 were not (Ab 1.2). They were fitted with abomasal and distal ileal cannulae and duodenal electrodes. At intervals of 3-7 d they received abomasal infusions of liquid test feeds in which protein was either provided by milk or AHS or non-antigenic soya concentrate (Ag and Ab 0.0; NASC) or milk plus untreated soya flour (Ag 12-13; SBF). Motility and intestinal transit time (TT estimated by the arrival of phenol red at the ileal cannula) were recorded.

Preliminary results (table I) given as percentage of milk values (mean  $\pm$  SEM: TT, 187  $\pm$  40 min; number of migrating myoelectric complexes per h (MMC/h), 1.02  $\pm$  0.28; duration of first postprandial irregular spike activity (PPISA), 133  $\pm$  30.6 min) showed that TT in insensitive calves was minimally affected by the soya diets. TT in sensitive calves was highly reduced after SBF and AHS1 (often associated with diarrhoea) while TT was reduced to a lesser extent after NASC and AHS2 (no diarrhoea).

These observations were supported by the motility results, mainly after SBF and AHS1 (increased MMC/h and reduced PPISA in sensitive calves) and suggest that AHS2 had less effect *in vivo* than AHS1.

*In conclusion*, giving antigenic soya to sensitive calves led to drastic motility changes. Products with high *in vitro* antigenicity can behave differently *in vivo* and motility and transit measurements may be more effective in discriminating between these products.

Sissons JW, Pedersen HE, Duvaux C, Thurston SM, Starkey S, Wass JAH (1987) *Food Allergy* (Chandra RK, ed). Nutr Res Educ Fdn, St Johns, Newfoundland, 95-108

**Table I.** Mean (% of milk values) for motility parameters in calves.

Protein source	Insensitive calves			Sensitive calves		
	MMC/h	PPISA	TT	MMC/h	PPISA	TT
SBF	92	92	70**	177	16**ab	32**
AHS1	126	103	81 <sup>a</sup>	194**	39**ac	40**
AHS2	58*	145*	93	140**	89 <sup>bd</sup>	60*
NASC	79***	76***	103* <sup>b</sup>	121*	64 <sup>cd</sup>	60*
(SEM)	(8.2)	(9.9)	(5.1)	(16.8)	(8.3)	(6.2)

\* 1 or 2 values only, \*\* different from milk values ( $P < 0.05$ ); a, b, c, d differences between means within columns ( $P < 0.05$ ).