

# The effects of Sepiolite-SPLF on heavy pigs fed liquid diets

L. Sardi<sup>1</sup>, G. Martelli<sup>1</sup>, R. Scipioni<sup>2</sup>, P. Parisini<sup>1</sup>

<sup>1</sup> DIMORFIPA – Alma Mater Studiorum – Università di Bologna, Italy.

<sup>2</sup> Dipartimento Interdisciplinare Scienze Agrarie, Scienze della Formazione e Scienze della Programmazione Sanitaria – Università di Modena e Reggio Emilia, Italy.

**RIASSUNTO** – Sepiolite-SPLF nell'alimentazione liquida del suino pesante – Sono stati utilizzati 330 suini omogeneamente ripartiti in due gruppi nell'ambito dei quali uno riceveva un mangime al quale era stata aggiunta Sepiolite-SPLF in ragione dell'1%. La presenza dell'additivo non ha indotto modificazioni delle prestazioni di allevamento dei suini (IPG e ICA) e delle caratteristiche qualitative delle carni (pH, colore, composizione acidica dell'adipe di copertura). Alla macellazione, nell'ambito del gruppo di animali trattati con SPLF, è stato possibile osservare un significativo ( $P < 0,05$ ) aumento della percentuale delle carcasse che si collocavano nella classe intermedia di peso (133-146 kg); tale riscontro testimonia una maggiore uniformità degli animali.

**KEY WORDS:** pigs, liquid feeding, performance, sepiolite.

**INTRODUCTION** – Liquid feed delivery systems for pigs have tended to be more common in areas where liquid by-products (*i.e.* dairy whey) are readily available and where the size of the production unit can justify the capital expenditure involved. The potential advantages of liquid feeding include: a) reduction of feed loss during handling and feeding; b) improvement in the pig's environment due to the reduction of dust in the atmosphere; c) improved pig performance and feed conversion rate (Jensen and Mikkelsen, 1998; Dell'Orto *et al.*, 1992); d) flexibility in raw material use (opportunity to utilise more economic food source, *i.e.* silages); e) improved dry matter intake in lactating sows. However, very few studies have been done concerning technical quality of the liquid feed with respect to homogeneity, fluidity and sedimentation (Hoppenbrock *et al.*, 1998).

Beside its properties as a pellet binder, Sepiolite - a widely used natural feed additive (E562) - can help in preventing these problems. Due to its rheological properties SPLF (Sepiolite for Pig Liquid Feeding) acts as a suspending agent and consequently can improve the quality of liquid feed as demonstrated by previous experiments, which pointed out a reduction of sedimentation and an improvement of homogeneity and fluidity (Hoppenbrock *et al.*, 1998; Heidenreich *et al.*, 2000).

The aim of the present trial was to evaluate the effect of the addition of SPLF at 1% on growing performance and carcass quality of heavy pigs fed practical diets.

**MATERIAL AND METHODS** – A total of 330 Duroc x (Landrace x Large White) pigs, half castrated males and half females was used. The trial started at 63.5 kg body weight and ended at slaughtering (170 kg body weight). Pigs were allotted to two experimental groups (Control group and SPLF group) each containing 11 replications of 15 pigs. All the pigs received a water-diluted feed (23.5% dry matter). Feed of pigs belonging to SPLF group was added with Sepiolite at 1%.

The following data were collected:

- initial and final body weight (per replication);
- initial and final individual body weight (three replications per thesis);
- feed intake (per replication);
- health status (individual);

- individual carcass weight and lean meat yield;
- main qualitative traits of meat (pH, colour, relative fatty acid composition of lard).

Liquid feed in the mixing tank and along the different troughs of the feeding system of the farm was periodically analysed for dry matter content.

**RESULTS AND CONCLUSIONS** – The addition of SPLF resulted in a better homogeneity of liquid feed as demonstrated by lower standard deviation values of DM content (24.94 % ± 0.20 SPLF vs 23.81 % ± 0.43 Control).

SPLF-treated pigs did not show any significant modification of growing parameters (*i.e.* avg. daily weight gain and feed conversion rate) when compared to control animals (Table 1).

Results concerning slaughtering parameters (Table 2) allow the following considerations:

- the addition of SPLF did not modify the main qualitative traits of meat and fat; this fact must be considered as a pre-requisite for the use of a feed additive in the framework of PDO (Protected Denomination Origin) productions.

- The addition of SPLF resulted in a higher uniformity degree of carcasses as it was demonstrated by a significant ( $P < 0.05$ ) higher number of pigs (49% vs 34%) in the weight class comprised between 133 and 146 kg body weight ( $\pm 6.5$  kg with respect to an average slaughtering body weight of 139.5 kg) and by lower values of standard deviation of carcass weight.

Table 1. Growing performances of pigs (mean values).

Groups		Control	SPLF
<i>Items (replication)</i>			
Replications	no.	11	11
Animals	no.	165	165
Initial weight	kg	62.8±6.1	64.2±5.7
Final weight	"	161.2±7.7	163.6±6.7
ADG	g/d	800±34	808±61
Feed intake	kg/d	2.57±0.12	2.53±0.13
FCR		3.66±0.22	3.57±0.28
<i>Items (individual)</i>			
Animals	no.	45	45
Initial weight	kg	60.3±9.9	61.1±8.2
Final weight (123 d)	kg	164.6±14.3	166.3±14.5
ADG	g/d	845±78	855±111

**REFERENCES** – Hoppenbrock, K.H., Latka, S., Bonekamp, B., Alvarez, A., Ihnen, T., Escribano, F., 1998. EAAP Annual Meeting, Warsaw, Poland, 24-27 August. Heidenreich, E., Strauch, W., Bonekamp, B., Alvarez, A., Gomez, G., Escribano, F., 2000. EAAP Annual Meeting, The Hague, The Netherlands, 21-24 August. Dell'Orto, V., Savoini, G., Bontempo, V., 1992. *Sel. Vet.* 33:395-408. Jensen, B.B., Mikkelsen, L.L., 1998. Recent advances in animal nutrition, Nottingham University Press, 107-126. Brooks, P.H., Moran, C., Beal, J.D., 1999. Proceedings of Alltech's 15<sup>th</sup> annual symposium. Nottingham University Press, 111-129

Table 2. Slaughtering performances of pigs and meat quality (mean values).

Groups		Control	SPLF
Animals	no.	100	100
Carcass weight	kg	139.1±13.1	139.7±12.0
<i>Carcass classification</i>			
< 133 kg	%	33	26
133-146 kg	"	35 <sup>a</sup>	52 <sup>b</sup>
>146 kg	"	32	22
Lean meat (F-o-M)	%	48.2±3.5	48.1±3.1
<i>Meat quality</i>			
pH 45'		6.7±0.2	6.6±0.21
pH 24 h		5.6±0.1	5.6±0.1
<i>Ham colour</i>			
L*		47.5±4.0	47.2±3.3
hue		0.4±0.1	0.4±0.1
chroma		10.1±1.7	10.2±2.0
<i>Fatty acid composition (*)</i>			
C 18:2	%	12.3±1.1	13.47±1.0
Saturated fatty acid	"	36.6±2.6	35.94±2.12
Unsaturated fatty acid	"	63.4±2.6	64.1±2.1
UFA/SFA		1.74±0.20	1.79±0.17

(\*) Analysis performed on 30 samples per group

a, b =  $P < 0.05$