

肥育豚におけるフェニルピペラジン系鎮静剤の闘争抑制の 効果

誌名	日本大学農獣医学部學術研究報告
ISSN	00780839
著者名	酒井,健夫 浜川,昌啓 尹,鍾三
発行元	日本大学農獣医学会
巻/号	48号
掲載ページ	p. 128-130
発行年月	1991年3月

農林水産省 農林水産技術会議事務局筑波産学連携支援センター
Tsukuba Business-Academia Cooperation Support Center, Agriculture, Forestry and Fisheries Research Council
Secretariat



Effects of A Phenylpiperazine Sedative on Fighting in Pigs During Fattening

Takeo SAKAI, Masaaki HAMAKAWA, Chong-Sam YOON, Matsuyuki NISHINO * , Takashi OHMI*, Sachie NOGI and Soshichi NAGAO

Lab. Veterinary Preventive Medicine and *Experimental Farm, Coll. Agr. & Vet. Med., Nihon Univ., 1866 Kameino, Fujisawa-shi, Kanagawa 252

(Accepted Nov. 15, 1990)

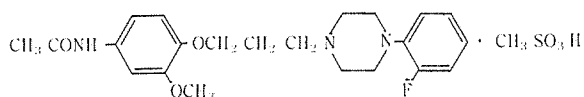
ABSTRACT. In groups of pigs treated intramuscularly with 0.5 and 0.3 mg/kg of mafoprazine mesylate, a phenylpiperazine sedative, a significant decrease in the fighting frequency and the number of bites at re-grouping during fattening was observed compared with the group treated with physiological saline.

Key words: Phenylpiperazine sedative, Pig, Fighting

The intensive management of the same-aged pigs contributes to cost reduction and effective utilization of pigsties, and pigs are sometimes transferred from one pigsty to another for re-grouping during fattening. However, after a re-grouping of pigs which had been maintained in different pigsties, there might be intense and repeated fightings for establishing social order, causing severe stress resulting in anorexia [1], decreases of body weight gain, and poor meat quality, as well as decreases of productivity. In this study, effects of 4'-[3-[4-(o-fluorophenyl)-1-piperazinyl]propyl]oxy]-3'-methoxyacetanilide methanesulfonate (mafoprazine mesylate; MM), a phenylpiperazine sedative, on fighting behavior of pigs during the fattening were evaluated.

Materials and Methods

10 mg/ml solution of MM (Mafropan; Tanabe, Osaka) and 40 mg/ml solution of azaperone (Stresnil; Sankyo, Tokyo) were used. The structure, and molecular weight of MM is as follows.



(C₂₂H₂₈FN₂O₃ · CH₃SO₃H, molecular weight: 497.59)

Forty Large White (LW) females and hogs aged 12 to 13 weeks weighing about 40 kg, were obtained from a Pig Farm B (Ayase, Kanagawa), and they were freely given a ration (Marukami Pigace C; Kanakei Sangyo, Yokohama) and water.

The pigs were randomly divided into 3 groups of 12 to 15 animals and reared for 4 weeks in each pigsty. Thereafter, 4 groups A to D consisting of 10 animals were constituted and placed in each pigsty. Immediately after re-grouping, Group A and B received intramuscular (i. m.) injection of 0.5 mg/kg and 0.3 mg/kg of MM, respectively, while Group C 1 mg/kg of azaperone and Group D 2 ml of physiological saline.

The intensity, frequency, and duration of fighting were evaluated during a 5-hour period after re-grouping, and the fighting scores [2] were obtained by grading and scoring the fighting as follows: Score 1 (pushing between two animals), Score 2 (biting between two animals), or Score 3 (intense fighting among 3 animals or more), which were multiplied by the frequency and duration (sec).

Results and Discussion

In Group C treated with azaperone, intense fighting frequently occurred following the re-grouping, as shown in Table 1.

Table 1. Frequency and duration of fighting in pigs intramuscularly treated with mafoprazine mesylate

Group	Drug	Number of pigs	Fighting ^{a)} scores	Frequency of fighting (hr)						
				~1	~2	~3	~4	~5	total	
A	Mafoprazine mesylate	0.5mg/kg	10	+	0	4(21) ^{b)}	2(30)	1(2)	2(10)	9(63)
				++	0	0	2(35)	1(45)	3(21)	6(101)
				+++	0	0	0	0	0	0
				total	0	4(21)	4(65)	2(47)	5(31)	15(164)
B	〃	0.3mg/kg	10	+	0	3(7)	7(20)	6(81)	9(21)	25(129)
				++	0	0	0	0	0	0
				+++	0	0	0	0	0	0
				total	0	3(7)	7(20)	6(81)	9(21)	25(129)
C	Azaperone	1 mg/kg	10	+	22(228)	12(40)	3(9)	5(38)	7(27)	49(342)
				++	7(44)	2(4)	1(30)	3(75)	3(90)	16(243)
				+++	0	0	0	1(5)	0	1(5)
				total	29(272)	14(44)	4(39)	9(118)	10(117)	66(590)
D	Physiological saline	10	10	+	10(53)	12(37)	3(12)	3(8)	2(7)	30(117)
				++	4(60)	3(21)	0	1(37)	0	8(118)
				+++	0	0	0	0	0	0
				total	14(113)	15(58)	3(12)	4(45)	2(7)	38(235)

a) Score 1: pushing between two animals. Score 2: biting between two animals. Score 3: intense fighting among 3 animals or more.

b) Total duration (seconds).

In Group D treated with physiological saline, fighting of Scores 1 and 2 occurred frequently and persisted for 3 days. In contrast, Groups A and B treated with MM, the numbers of bites were significantly lower than in Group

D ($p < 0.01$, and $p < 0.05$, respectively) (Table 2). These groups showed no apparent fighting during 2 hr after the injection, although low grade sporadic fighting was observed thereafter.

Table 2. Fighting scores and numbers of bites in pigs intramuscularly treated with mafoprazine mesylate

Group	Drug	Number of pigs	Number of bites ^{a)}											Total number of animals with bites	
			0	1	2	3	4	5	6	7	8	9	10<		
A	Mafoprazine mesylate	0.5mg/kg	10	6	2	1	1	—	—	—	—	—	—	—	7** ^{b)}
B	〃	0.3mg/kg	10	—	2	6	1	—	1	—	—	—	—	—	22*
C	Azaperone	1 mg/kg	10	—	—	2	3	1	—	—	—	2	2	—	51
D	Physiological saline	10	10	—	—	1	2	2	1	2	—	—	—	2	60

a) Number of pigs having the indicated number of bites.

b) Significantly different from the control group by one-way analysis of variance (* $p < 0.01$, ** $p < 0.05$).

For prevention of fighting, re-grouping according to the growth stage and body weight is important [3]. In addition, use of tranquilizers such as azaperone [4, 5, 6] has been reported to reduce stress effects, resulting in growth promotion, increase of food intake and survival rates [7]. The inefficacy of azaperone in this study might be due to a transient excitation immediately after administration. The dose of mafoprazine mesylate showed specific inhibition of fighting and much lower catalepsy-

inducing action [4, 8, 9, 10], than that of azaperone in rats and was reported to be excreted into urine within 8 hr and into stools within 24 hr and did not remain in any organs nor tissues after 24 hr [11, 12].

References

- 1 Rogiers, M. 1973: Control of stress in the swine. Jpn. J. Swine Res., 10, 83-85 (in Japanese).
- 2 Uchino, T., Koyama, S., Sakoh, T. and Motoyoshi, S.

- 1989: Inhibition of fighting by mafoprazine mesylate in pigs. *J. Vet. Med. (Jpn)*, 811, 47-49 (in Japanese).
- 3 Yoshimoto, T. 1989: Behavior of pigs. 192-197. In "Progress in Veterinary Science 1989 (Izawa, H. and Shimizu, A., eds.)", Kindai Shuppan, Tokyo.
- 4 Callear, J. F. F. and Van Gestel, J. F. F. 1971: An analysis of the results field experiments in pigs in the U. K. and Ireland with the sedative neuroleptic azaperone. *Vet. Rec.*, 89, 453-456.
- 5 Cox, J. E. 1973: Immobilization and anaesthesia of the pig. *Vet. Rec.*, 92, 143-147.
- 6 Symoens, J. and Van Den Brande, M. 1969: Prevention and cure of aggressiveness in pigs using the sedative azaperone. *Vet. Rec.*, 85, 64-67.
- 7 Brown, R. G. 1973: Use of tranquilizers and anti-stress agents in swine nutrition. *Feedstuffs*, 45, 28-29.
- 8 Nakagawa, H., Yamamura, M., Kinoshita, K., Kudo, Y., Ochiai, T., Nosaka, K., Narita, H., Yamaguchi, I. and Ishida, R. 1988: General pharmacology of mafoprazine, a new phenylpiperazine derivative. *Pharmacometrics*, 36, 105-115 (in Japanese with English summary).
- 9 Yamamura, M., Nakagawa, H., Kinoshita, K., Ochiai, T. and Ishida, R. 1988: A behavioral pharmacological study of mafoprazine, a new phenylpiperazine derivative. *Jpn. J. Pharmacol.*, 48, 203-212.
- 10 Yamamura, M., Nakagawa, H., Maeda, K., Kinoshita, K. and Ishida, R. 1989: Effects of mafoprazine, a phenylpiperazine derivative, on the central dopaminergic system. *Jpn. J. Pharmacol.*, 50, 295-305.
- 11 Fujihara, M., Hirakoso, K., Nakamura, T. and Harigawa, S. 1987: Biological fate of ^{14}C -1-[3-(4-Acetamido-2-methoxyphenoxy) propyl]-4-(2-fluorophenyl) piperazine methanesulfonate (IK-640) in rats. *Pharmacometrics*, 33, 95-107 (in Japanese with English summary).
- 12 Research for Animal Science in Biochemistry and Toxicology 1985: Absorption, excretion, and metabolism of IK-640 in pigs. 1-24.

肥育豚におけるフェニルピペラジン系鎮静剤の闘争抑制の効果

酒井健夫*¹・浜川昌啓*¹・尹鍾三*¹・西野松之*²
大見孝*²・野木幸恵*¹・長尾壯七*¹

*¹日本大学農獣医学部獣医衛生学研究室 *²日本大学農獣医学部附属農場

(1990年11月15日受理)

フェニルピペラジン系鎮静剤である mafoprazine mesylate の0.5mg/kg および0.3mg/kg を肥育豚の群再編時に筋注し、その闘争抑制効果を検討した。その結果、1群を10頭とした肥育豚に前記投与量を筋肉内注射した群では、注射後2時間までは闘争はほとんど認められず、

鎮静効果は大きく、さらに闘争に基づく咬傷数も生理食塩水投与群および対照薬剤の azaperone 1 mg/kg 投与群に比べ有意に少なかった ($p < 0.01$)。このように mafoprazine mesylate は、明らかに肥育豚の群再編時の闘争を抑制した。