

INVESTIGATION OF THE GALACTAGOGUE POTENTIAL OF FENUGREEK IN SOWS

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Executive Summary

The aim of this project was to test the potential of Fenugreek powder, supplemented to lactating sows, to increase milk production and piglet weight gain. Fenugreek is a herb and its seeds have (sometimes anecdotally) been reported to increase milk secretion in breastfeeding women. If Fenugreek increases milk production in sows, it could increase piglet growth during lactation in general, but would also serve as a remedy for dysgalactia, or milk production failure.

Multiparous sows (n=43) served as controls, or were supplemented with 12 g/d or 24 g/d of ground Fenugreek seeds respectively. The Fenugreek was supplemented as a top-dress. Fenugreek was supplemented in the second and third week of lactation, with piglet weight gain during the first week serving as a control. Piglet weight gain in week 1 (180 g/d), in week 2 (237 g/d), and in week 3 (269 g/d) of lactation was not influenced by Fenugreek supplementation. Milk production was also estimated by a weigh-suckle-weigh procedure. In this procedure, piglets are separated from their dam, and allowed to suckle at 45 min intervals. Immediately prior and immediately following a suckling bout, piglets are weighed and the increase in weight serves as an estimate of milk volume consumed. The weigh-suckle-weigh procedure also did not point to any effect of the Fenugreek supplementation.

The results from this project do not indicate a potential of Fenugreek supplementation in sows to increase milk production at the given dosages. These dosages were based on recommendations in humans and may therefore be insufficient.

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1. Introduction

During lactation, piglets rely on sow milk as their main nutrient source. Adequate milk production shortly after farrowing is essential for the piglets' survival, for growth, and to build their 'resistance' to environmental challenges such as diseases. After three to four weeks of lactation, piglets are weaned, and the growth during lactation will determine how well piglets have developed to cope with the post weaning environment. Therefore, milk production early after farrowing as well as throughout the rest of lactation is important, and treatments that increase milk production or prevent failure of milk production in early lactation (dysgalactia), will benefit piglet development and their chance of survival.

Fenugreek (also known as Greek Hay or Fenigreek), is a herb that is commonly found growing in the Mediterranean regions of Southern Europe and Asia. Both the seeds and leaves are primarily used as a culinary spice. However, Fenugreek has also been reported (sometimes anecdotally) to increase milk production in lactating women, within 24-72 h after the start of treatment with ground Fenugreek seeds (Gabay, 2002). In pigs, there are no reports of the effects of Fenugreek on milk production to our knowledge. If Fenugreek has a galactagogue effect in pigs, it could be used 1. to increase milk production in general, or 2. as a treatment in cases of agalactia or dysgalactia in early lactation.

AIM

To investigate the galactagogue potential of Fenugreek in lactating pigs and to identify whether the effect is dose-dependent.

2. Methodology

Multiparous sows (n = 43) were allocated to one of three treatments after farrowing: 1. Control, 2. Fenugreek supplement, 12 g/day, or 3. Fenugreek supplement, 24 g/day. Sows were allocated according to parity. Litter size was standardised to 11 piglets within 24 h after farrowing. The two dosages of Fenugreek represent the range in what is advised for women who take Fenugreek to boost breast milk production, on a body weight basis. Sows in treatment 2 and 3 did not receive the Fenugreek supplement until day 8 after farrowing. The first week of lactation was used as a control to allow correction for variation in milk production and litter growth between sows.

During lactation, all sows were fed the same standard lactation diet and feed allowance was increased step-wise from 2.5 kg after farrowing, with 0.5 kg per day or more if the sows had finished their feed, up to their maximum feed intake. Feed allocation and refusals were recorded on a daily basis. Sows were fed three times per day during lactation. The Fenugreek powder was topdressed over the morning ration (treatment 2) or over the morning and noon ration (treatment 3).

Litters were weighed at Day 4, Day 8, Day 15 and Day 22 after farrowing. Litters were not weighed until day 4 because most mortality and litter changes occur in the first few days after farrowing. Litter growth rate between day 4 and day 8 served as a measure of milk production in the first week of lactation. Sows were weighed after farrowing and subsequently every week. Blood samples were taken from sows by jugular venipuncture on day 8, 15, and 22 to assess concentration of prolactin.

On days 15 and 22, weigh-suckle-weighs were performed to estimate milk production. Litters were separated from the sow and then weighed before allowing to suckle after 45 min of separation. Immediately upon finishing the suckling bout, piglets were weighed again. This procedure was performed three times in succession, and the second and third suckle were used to estimate milk production. The weigh-suckle-weigh procedure was only performed in litters which had 10 or 11 piglets on the day.

3. Outcomes

Of the 43 sows enrolled in the study, 6 were removed from the trial during lactation for various reasons. Voluntary feed intake of the sows was 4.0 ± 0.1 kg, 6.0 ± 0.2 kg, and 6.5 ± 0.2 kg in week 1, week 2, and week 3 of lactation. Supplementation with Fenugreek did not affect feed intake. At the start of lactation the average body weight of the sows was 284 ± 8 kg (range 213 to 394 kg). Body weight loss of the sows was -5.3 ± 1.1 kg, -2.5 ± 1.1 kg, and -4.4 ± 0.9 kg, in week 1, 2 and week 3 of lactation, and total body weight loss in 3 weeks of lactation was -12.0 ± 2.3 kg on average. Body weight and body weight loss were not different between treatments. Total body weight loss was correlated to average feed intake during lactation ($r = 0.61$; $P < 0.01$).

Litter performance characteristics are presented in Table 1. Litter weight gain and average weight gain per piglet were not different between treatments. Also when corrected for litter size and for weight gain during the first week of lactation there was no difference between treatments. Piglet weight gain was not related to body weight loss or feed intake of the sows during lactation. Litter size at one, two and three weeks of lactation did not differ between treatments.

Table 1. Piglet performance (Means \pm SE) during lactation.

	Control	Fenugreek, 12 g/day	Fenugreek, 24 g/day
N	12	11	15
Average gain piglets, g per day			
D4-8	184 \pm 16	181 \pm 22	178 \pm 30
D9-15	227 \pm 17	247 \pm 17	236 \pm 12
D16-22	266 \pm 16	272 \pm 20	268 \pm 14
Litter size			
D8	10.3 \pm 0.2	10.2 \pm 0.3	10.6 \pm 0.2
D15	10.2 \pm 0.2	10.0 \pm 0.3	10.3 \pm 0.3
D22	9.6 \pm 0.4	9.7 \pm 0.4	10.3 \pm 0.3
Litter gain, g per day			
D4-8	1867 \pm 154	1826 \pm 224	1860 \pm 344
D9-15	2298 \pm 169	2479 \pm 187	2428 \pm 126
D16-22	2599 \pm 166	2634 \pm 209	2735 \pm 146

The estimated milk production at 45 min suckle intervals, based on the weigh-suckle-weigh procedure, is presented in Table 2. The estimated milk production on day 15 and 22 was not correlated to litter weight gain in week 2 and 3, respectively. There was considerable variation between litters in the estimated milk production and, occasionally, a reduction in litter weight was recorded after a suckling bout. There was no difference between treatments in milk production estimated by the weigh-suckle-weigh procedure.

Table 2. Milk ejection estimated by the weigh-suckle-weigh procedure

	Control	Fenugreek, 12 g/day	Fenugreek, 24 g/day
N	8	8	9
Average estimated milk ejected, g			
D15	277 \pm 41	236 \pm 66	181 \pm 48
(range)	(132 - 392)	(-82 - 470)	(5 - 442)
D22	528 \pm 232	332 \pm 54	589 \pm 378
(range)	(-2.5 - 1827)	(90 - 510)	(122 - 2857)

Litters were separated from sows and allowed to suckle at 45 min intervals and weighed immediately pre- and post suckling. The average litter weight change after the second and third suckling bout was recorded as an estimate for volume of ejected milk.

4. Application of Research

Because no effect was observed from supplementing sows with Fenugreek in the second and third week of lactation on litter weight gain or estimated milk ejection during the weigh-suckle-weigh tests, there appears to be no application from the current project.

5. Conclusion

Supplementation with fenugreek at 12 g or 24 g per day during the second and third week of lactation does not increase piglet weight gain and therefore Fenugreek does not seem to increase milk production at the supplemented dosages.

6. Limitations/Risks

Fenugreek was supplemented at 12 and 24 g/day. This was based on the range in (non-medical) recommendations for breastfeeding women, recalculated to match the average body weight of a lactating sow. The dosage supplemented in this study may be too low, although it must be noted that the 24 g/day represents the upper range in dosages recommended for humans. Nevertheless, the physiology of the lactating sow may still require a higher dose to observe effects.

7. Recommendations

Supplementation with Fenugreek may have to be tested at a higher dosage. Also, it would be relevant to start supplementation immediately after farrowing.

8. References

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