Survey of current Swiss pig feeding practices and potential for ammonia emission reduction

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Introduction

To achieve the goals on ammonia emission, mitigation programs focus on measures that diminish ammonia losses from animal housings, manure storage and spreading. Dietary modifications as a begin-of-pipe measure will affect all emission stages from barn to field. An effective way to reduce N-excretion, from livestock is achieved by the reduction of dietary CP, while maintaining amino acid levels.

Objective

The aim of the present study was to gain an overview of the current pig feeding practices in Switzerland.

Materials and methods

A survey was conducted in feed manufactures, comprising 80% of the Swiss pig feed market. Based on diet specifications and sales volumes, the usage of NPr-feed (N and P reduced feed) and the average nutrient content of different feeds were calculated. To verify if declared diet specifications corresponded with the actual concentrations, declared and analyzed data from 108 diets were compared. Based on the Swiss ammonia emission modeling tool (www.agrammon.ch), the reduction potential was calculated for different types of farms.

Results

The survey showed that 70% of the feed available on the market are sold as NPr-feed. The percentage is highly variable within regions and between feed mills, reaching over 90% in animal dense regions. The analyses revealed no protein over-formulation compared to the declared values. Thus, the survey based on declared values correspond with the actual situation in the market.

The difference in CP concentration between standard and NPr feed was larger in diets for fattening pigs compared to sow or piglet diets (Table 1)

The emission reduction potential when switching from standard to NPr feed varies depending on the production system for fattening farms from 13-17% and for sow units from 8-11% (Table 2).

Table 1: Average CP concentration of standard and NPr diets

Pig feed	ME MJ/kg	CP g/kg	Lys g/kg	P g/kg	CP/ME g/MJ
Dry sow feed std	12.05	144.97	6.54	6.05	12.06
Dry sow feed NPr	12.26	139.12	6.67	4.41	11.36
Lactation feed std	13.68	178.85	10.08	5.92	13.11
Lactation feed NPr	13.73	164.81	10.04	4.68	12.01
Piglet feed std	13.74	177.30	12.21	5.67	12.90
Piglet feed NPr	13.84	169.07	12.27	5.10	12.21
Grower-finisher std	13.57	172.95	9.97	5.15	12.76
Grower-finisher NPr	13.72	158.04	10.12	4.01	11.52
Finisher feed std	13.36	161.10	9.17	4.64	12.06
Finisher feed NPr	13.7	155.76	9.34	3.92	11.35

Table 2: Reduction potential in ammonia emission for different type of farms

	Conventional barn				Open barn			
	No measures*		measures*		no measures*		measures*	
	std	NPr	std	NPr	std	NPr	std	NPr
Fattening unit (per 100 places)								
Total kg N / y	589	526	429	376	731	650	595	522
Ammonia reduction	----	16%	----	13%	----	17%	----	13%
Sow unit (per 100 sows)								
Total kg N / y	1248	1176	845	785	1522	1430	1168	1084
Ammonia reduction	----	11%	----	8%	----	11%	----	8%

* emission reduction measures include covering of slurry pit and spreading of slurry with trailing hose

Conclusion

- The 30% of total feed still being sold at standard CP concentrations offers a considerable potential (8-17 %) to reduce N-input and concomitantly ammonia emissions in Swiss pig production.
- Fattering units which are already using NPr diets can achieve a further reduction by lowering the CP concentrations in the finisher diets.

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