
EXECUTIVE SUMMARY

The amino acid (AA) digestibility of different feedstuffs in the nutrition of the early weaned piglet.

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OBJECTIVES: : 1. To use an *in vivo* method with roosters to determine the apparent amino acid digestibility of different feedstuffs for early weaned piglets.

2. To compare the rooster *in vivo* method with the best available pig *in vivo* method.

3. To determine if there are any differences in apparent amino acid digestibility between piglets and growers.

4. To determine the apparent digestible lysine requirements of the piglet.

5. To balance diets for early weaned piglets using protein sources of different origin (plant, animal and milk) on an iso apparent available amino acid basis and to compare these diets in a growth assay.

SUMMARY

A series of trials was performed to obtain results to meet the different objectives. Performing AA digestibility studies in piglets showed that the cannula technique appeared to be the most appropriate to use with piglets if the confidence interval of determining apparent ileal digestibility values and practical aspects regarding ease of handling and sampling, surgical severity and possible stress on the piglets, were taken into consideration.

The comparison of amino acid digestibility of feedstuffs between piglets, growing finishing pigs and cectomised cockerels was performed to determine if values determined with the different methods were comparable. Results showed that cectomised cockerels were not suitable to determine AA digestibility values in pigs for feeds low in protein. For feedstuffs high in protein content agreement in digestibility values obtained were good. Amino acid digestibility values of roasted full fat soya bean meal could be influenced by factors such as anti nutrient substances and inclusion rates in the experimental mixtures. It was shown that the comparison of methods within and between species is dependent on the feedstuff (or group of feedstuffs) to be evaluated.

The digestible lysine requirements for the live weight interval 6 to 15 kg in piglets were found to be 1.39 % with a corresponding requirement of 7.72 g lysine per day. From the data it is also evident that a digestible lysine to DE ratio (g/MJ) of 0.94 is sufficient for optimum performance of the piglet. The relationship between digestible and available AA's in heat treated protein sources however needs further attention. Applying determined digestible lysine values in weaner diets using different protein sources were utilised with an equal efficiency if balanced on digestible amino acid content and not on total amino acid content. However, differences in feed intake using protein sources of different origin probably because of palatability differences should be addressed in further work to ensure the effective use of such sources.

PUBLICATIONS AND PAPERS PRESENTED:

The data of the project were compiled in a PhD thesis which is submitted to the University of Stellenbosch.

Two scientific papers were submitted during December 1995 and two scientific papers during April 1996 to *Lives. Prod Sci.*

Two more scientific papers are currently been prepared for submission to *Lives. Prod Sci.*

Scientific Papers Submitted

VILJOEN, J., COETZEE, S.E., FICK, J.C., SIEBRITS, F.K., & HAYES, J.P., 1996. The ileal amino acid digestibility of different protein sources for early weaned piglets. Submitted to *Livest.Prod Sci.*

VILJOEN, J., RAS, M.N., HAYES, J.P. & SIEBRITS, F.K., 1996. True and apparent amino acid digestibilities of feedstuffs in pigs employing the mobile nylon bag (MNBT) -technique. Submitted to *Livest.Prod Sci.*

VILJOEN, J., COETZEE, S.E., FICK, J.C., SIEBRITS, F.K., & HAYES, J.P., 1996. Evaluation of piglet *in vivo* techniques for the determination of apparent ileal amino acid digestibilities of feedstuffs. Submitted to *Livest.Prod Sci.*

VILJOEN, J., COETZEE, S.E, SIEBRITS, F.K. & HAYES, J.P. 1996. Determination of amino acid digestibility of feedstuffs in caecectomised cockerels, piglets and growing-finishing pigs: a comparison of methods. Submitted to *Livest.Prod Sci.*

Scientific Papers due for Submission

VILJOEN, J., FICK, J.C., SIEBRITS, F.K. & HAYES, J.P. 1996. Digestible Lysine Requirements Of Early Weaned Piglets.

VILJOEN, J., LOOTS, L.J., SIEBRITS, F.K. & HAYES, J.P. 1996. Performance of piglets on diets equal in apparent digestible lysine using protein sources of different origin.

Thesis Submitted

VILJOEN, J., 1996. Studies on the determination of amino acid digestibility of feedstuffs for pigs. *Phd (Agric)* Thesis. Submitted to the University of Stellenbosh.

pers Delivered

- VILJOEN, J., COETZEE, S.E., FICK, J.C., PIETERS, H & DE VILLIERS, F., 1994. The evaluation of different techniques for the determination of amino acid digestibility in the piglet. SASAS Symposium, Warmbad.
- VILJOEN, J., COETZEE, S.E., FICK, J.C., 1995. True and apparent amino acid digestibility of feedstuffs in pigs by using mobile nylon bags in ileo-rectal anastomosis pigs. SASAS Symposium, Bloemfontein
- VILJOEN, J., COETZEE, S.E., SIEBRITS, F.K. & HAYES, J.P. 1996. The determination of amino acid digestibility of feedstuffs in caecectomised cockerels, piglets and growing-finishing pigs: a comparison of methodologies. All Africa congress on Animal Production. April, Pretoria.

Paper due.

- VILJOEN, J., FICK, J.C., SIEBRITS, F.K. & HAYES, J.P. 1996. Digestible Lysine requirements of early weaned piglets. To be presented at the Annual Meeting of the American Society for Animal Science 23 - 26 July in Rapid City, South Dakota, USA.
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