

Amino acid digestibility in Joosten protein concentrates (JPC 56 & FMR Ω 3) in comparison with Peruvian Super Prime fish meal fed to weanling pigs

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Introduction

High dietary levels of soybean meal are not well tolerated by weanling pigs. Animal protein sources such as fish meal (FM) are therefore usually included in diets fed to weanling pigs. However, animal protein can be connected with feed safety issues and shows a wide variety in quality, which is undesirable for young animals.

The Joosten protein concentrate 56 (JPC 56) and Fishmeal replacer omega 3 (FMR Ω3) are sources of vegetable high quality protein and amino acids (AA) designed for young animal nutrition. They highly value feed safety, promote gut health and have an excellent digestibility. In recent years, numerous in-vitro tests were performed, showing minimum protein digestibility levels of 95%. However, at this point, no data for in-vivo crude protein (CP) and AA digestibility have been reported for these products.

Methods

Eight weanling barrows (11.8 ± 0.5 kg) were surgically fitted with a T-cannula in the distal ileum¹ and allotted to a replicated 4 × 4 Latin square design with 4 diets and four 7d periods. Therefore, 8 replicate pigs were fed each diet.

In 4 dietary treatments* each protein source was included as the sole source of AA:

- FMR Ω3
- JPC 56
- Super Prime fish meal (FM)
- N-free diet

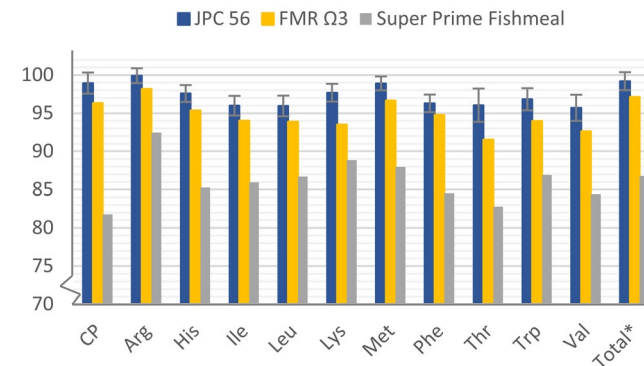
(to measure basal endogenous losses)

Ileal digesta were collected from canula¹ on d6 and 7, lyophilized and chemically analysed. From these data the apparent (AID) and standardized ileal digestibility (SID) for CP and AA² were calculated.

*All diets contained 0.4% chromic oxide as an indigestible marker.

Results

The CP for JPC 56, FMR Ω3 and FM were 55.4%, 58.1%, and 66.2% respectively. The AID of CP and all AA were lower (P < 0.05) in FM compared with JPC 56 and FMR Ω3 with the exception of Ala, where no difference was observed. The SID of CP and all AA were the least (P < 0.05) in FM compared with JPC 56 and FMR Ω3 (Figure) with the exception of Ala, where only JPC 56 had a greater (P < 0.05) SID than FM.



Standardized ileal digestibility of CP and indispensable amino acids (AA) in JPC 56, FMR Ω3 and Super Prime Fish meal. All graph values are significant with FM (P<0.001). *SID of all 17 (in)dispensable amino acids in total.

The results show an excellent in-vivo protein digestibility of Joosten Protein Concentrates, which confirming historical in-vitro data. SID of CP is 99.0% and 96.3% for JPC 56 and FMR Ω3 respectively, compared with 81.8% SID of CP for Super Prime Peruvian fishmeal (P<0.001).

Discussion

The values for SID of AA in fish meal were intermediate between values published for North American fishmeal³ and European fishmeal⁴. The SID values of CP for Joosten Protein Concentrates are higher compared to other available vegetable protein concentrates (Table) as well as SID values for most AA⁵.

	SID (%)
Enzyme-treated soybean meal	85.2- 91.9
Extruded soybean meal	86.2
Soy protein concentrate	82.2- 89.0
Fermented soybean meal	80.0-83.0
Fermented rapeseed	70.6

Conclusion

These results demonstrate that Joosten Protein Concentrates have superior crude protein and amino acid digestibility and are the preferred protein sources in young animal diets.

¹Stein et al., 1998 ²Stein et al., 2017 ³NRC, 2102

⁴Sauvant et al., 2004 ⁵Stein, 2016; Navarro et al., 2017; Pedersen et al., 2016

