

# Determination of the metabolic availability of phenylalanine in feedstuffs

Édelis Martinazzo-Dallagnol<sup>1</sup>, Soenke Moehn<sup>2</sup>, Robert F.P. Bertolo<sup>3</sup>, Paul B. Pencharz<sup>4</sup> and Ronald O. Ball<sup>2</sup>

<sup>1</sup>University of Viçosa, Brazil, <sup>2</sup>Swine Research & Technology Centre, 4-10 Agriculture/Forestry Centre, University of Alberta, Edmonton, AB T6G 2P5; <sup>3</sup>Memorial University, St. John's, NF, <sup>4</sup>Hospital for Sick Children, Toronto, ON. *Email:* ron.ball@ualberta.ca

Accurate determination of the metabolic availability (MA) of lysine in feeds requires the knowledge of the availability of the indicator amino acid, phenylalanine (PHE). Differences in PHE intake will alter PHE oxidation independent of the effects of the MA of lysine in test feeds. Our objective was to determine the availability of PHE using the direct oxidation method.

PHE must be oxidized quantitatively when supplied in excess of the requirement. Free PHE or protein-bound PHE from feedstuffs was added to a base diet providing 120% of the requirement, to obtain diets at 150% of the requirement. The ratio of oxidation change per g added PHE from feedstuffs to that from free PHE measures the MA of PHE. Four barrows were adapted for at least 7 d to either PHE level. PHE oxidation was determined over 4 h twice per pig after 3 days adaptation to the same gross PHE level (150%) provided by a range of feedstuffs. Allowing for the co-variables body weight, lysine intake and individual animal (procedure mixed, SAS 1999), PHE oxidation (% of dose) increased by 23.7 (SE 15.7) units/g free PHE added. Soybean meal, peas, canola meal and cottonseed meal increased PHE oxidation by 21.4 (SE 14.3), 21.0 (SE 13.3), 21.0 SE 13.0) and 22.0 (SE 12.9) units/g added PHE, respectively. The calculated MA for soybean meal (90.6%) and peas (88.5%) was similar to the estimated true ileal digestibility of PHE (NRC, 1998). The MA of PHE in canola (88.6%) and cottonseed meal (92.8%) was greater than the estimated true ileal digestibility of PHE (NRC, 1998).

## **Implications:**

The results indicate that the direct oxidation method can be used to determine the MA of PHE in feedstuffs.

Supported by Alberta Pork and Alberta Agricultural Research Institute.