

Antioxidant, immunomodulatory, and antibacterial effects of herbal feed products for pig gut health
SBA Halkes^{1,2,3}, MJ Groot^{3,4}, AGM van Asseldonk^{3,5}, G Kleijer-Ligtenberg^{3,5}, J Fink-Gremmels^{3,6}, E van den Worm^{1,7}, HC Quarles van Ufford¹, CJ Beukelman^{1,2}, AJJ van den Berg^{1,2}

¹Dept. Medicinal Chemistry & Chemical Biology, Utrecht University, ²PhytoGeniX BV, Utrecht, ³Fyto-V project-group (www.fyto-v.nl), ⁴RIKILT, Wageningen UR, ⁵IEZ, Beek-Ubbergen, ⁶Dept. Veterinary Pharmacy, Pharmacology & Toxicology, Utrecht University, ⁷ORAC-Europe BV, Utrecht

Supplementation of pig feed with herbal products may improve pig gut health and help to reduce the need for antibiotic use. To test this hypothesis, four commercially available herbal feed products were assayed for *in vitro* antioxidant, immunomodulatory and antibacterial effects.

The herbal feed products were found to contain essential oil components as principle ingredients. The total antioxidant activity as measured with the oxygen radical absorbance capacity assay ranged from 113 to 933 $\mu\text{mol TE/g}$. All tested products were found to attenuate reactive oxygen species production from stimulated polymorphonuclear leukocytes (IC₅₀-values of dichloromethane extracts ranging from 0,1 to 0,5 mg/ml). Likewise, bacterial growth of *E. coli* (K88⁺) clinical isolates from pigs was inhibited (ED₅₀-values of dichloromethane extracts ranging from 2,7 to 8 mg/ml).

These results further substantiate the claimed positive effects of these herbal feed products on gut health in pigs.