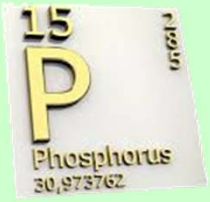
Abstract 18621
Session 55

Models for estimation of phosphorus excretion in heavy pigs

Davide Biagini and Carla Lazzaroni
Department of Agricultural, Forest and Food Science,
University of Torino, Grugliasco, Italy

AIM

To estimate **P potential excretion** in **heavy pigs' farms** using mathematical models



P apparent BALANCE:

$P_{excretion} = P_{intake} - P_{retention}$

P apparent EFFICIENCY:

$P_{efficiency} = P_{retention} / P_{intake}$

MATERIALS AND METHODS

- **farms**: 40 intensive farms
- **location**: Italian north-west plain
- **animals**: fattening heavy pigs
- **fattening period**: 7 months ca.
- **data**: farm management, feeding systems, feedstuff composition (including additives and integrators), feed consumption, pigs live weight (initial and final LW, ADG), feed composition (DM, ash, GP, EE, NDF, CF, P_{tot}, DE), slurry composition (DM, ash, GP, EE, NDF, CF, P_{tot}, FCR)

EQUATIONS

- **daily excretion** [eq. 1]

$$P_{excr\_day} = \Sigma (P_{feed} \times FCR_{head} \times ADG_{head}) - [0.009 + (8.830\ E^{-8})\ LW_{head} + (-\ 4.590\ E^{-5})\ LW^2_{head}]$$

- **fattening period excretion** [eq. 2]

$$P_{excr\_fat\_period} = P_{feed} \times FCR_{head} \times ADG_{head} \times D_{fattening} - (0.24 + 0.004\ LW_{final} - 0.007\ LW_{initial})$$

- **excretion (g/d) according to P intake (g/d)** [eq. 3]

$$P_{excr} = -\ 0.467 + 0.905\ P_{intake}$$

where:

P_{feed} = Phosphorus ration content (g/kg)
FCR = Feed Conversion Rate (kg/kg)
ADG = Average Daily Gain (kg)
LW = Live Weight of head, at the beginning or at the end of the fattening period (kg)
D = fattening days (n)

CONCLUSION

- **Eq. 1**: known swine ADG and FCR, estimates P excretion for each level of P ratio in feed, according to average animals LW
- **Eq. 2**: with same data and fattening period duration, estimates P excreted per head per fattening period
- **Eq. 3**: estimates P excretion on P intake (regression)