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"Estimation of whole body lipid mass in finishing pigs"

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Estimation of whole body lipid mass in finishing pigs

M. Kloareg*, J. Mourot, J. Noblet and J. van Milgen

UMR SENAH, INRA,

35590 Saint-Gilles, France

Why estimating the whole body lipid mass (L) ?

Calibration of pig growth models : estimation of protein (P) and lipid (L) deposition at the whole animal level.

What alternative to the chemical analysis of the whole animal (expensive, time consuming, loss of carcass value)?

P : BW gain

L : backfat depth (P2) ?

Find simple indicators for L and provide up-to-date relationships

Find simple indicators predicting L obtained *in vivo* or at slaughter

These indicators should be :

- easily obtained
- generic for several breeds
- applicable to the actual European range of slaughter weights

The experiment (30 pigs)

Maximise variability in fatness :

- two genotypes (Px(LWxLR) & LW)
- two sexes (females & barrows)
- slaughter at 90, 110, 130 & 150 kg

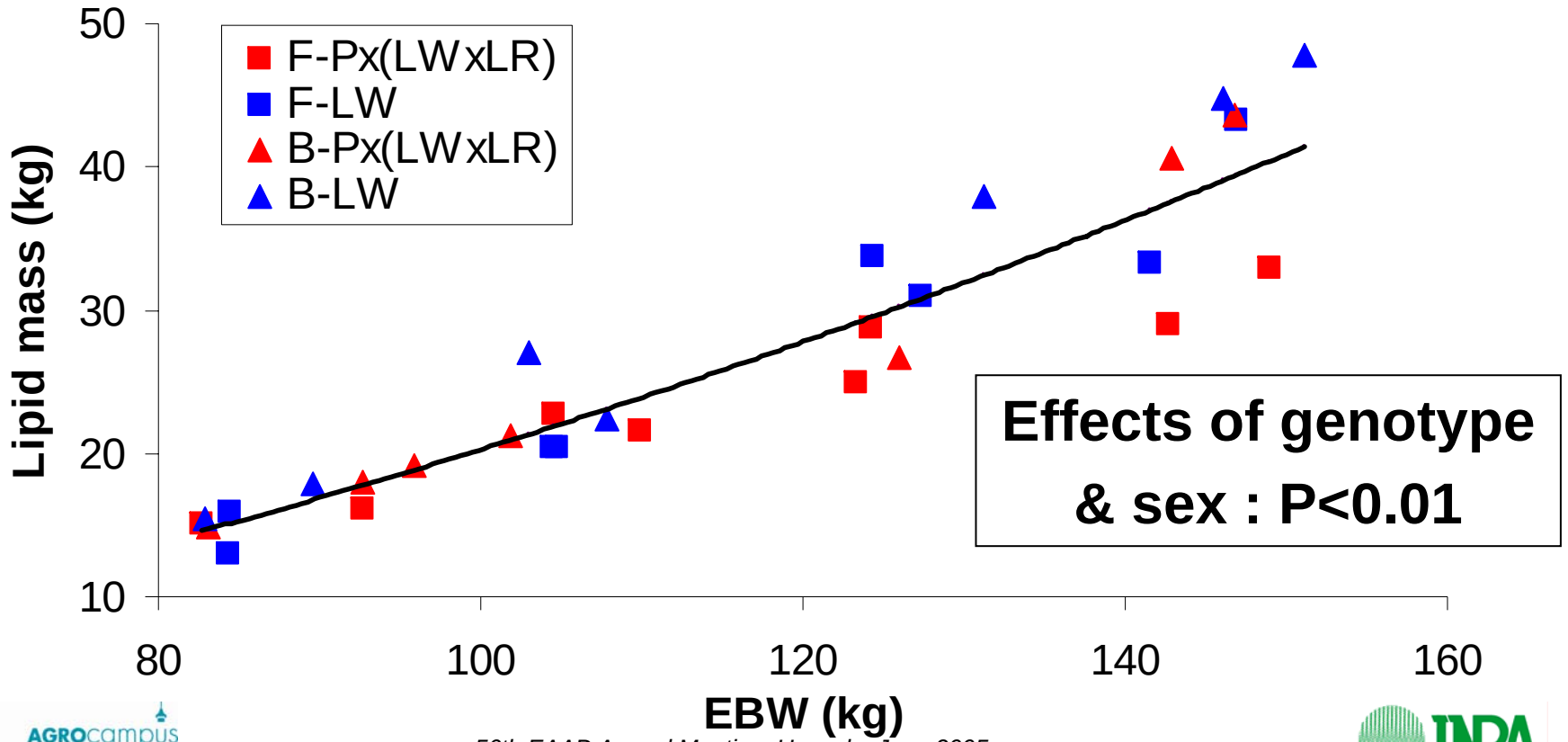
Measurments of :

- backfat & muscle thickness, *in vivo* & at slaughter
- weight of organs & primal cuts (backfat, leaf fat…)

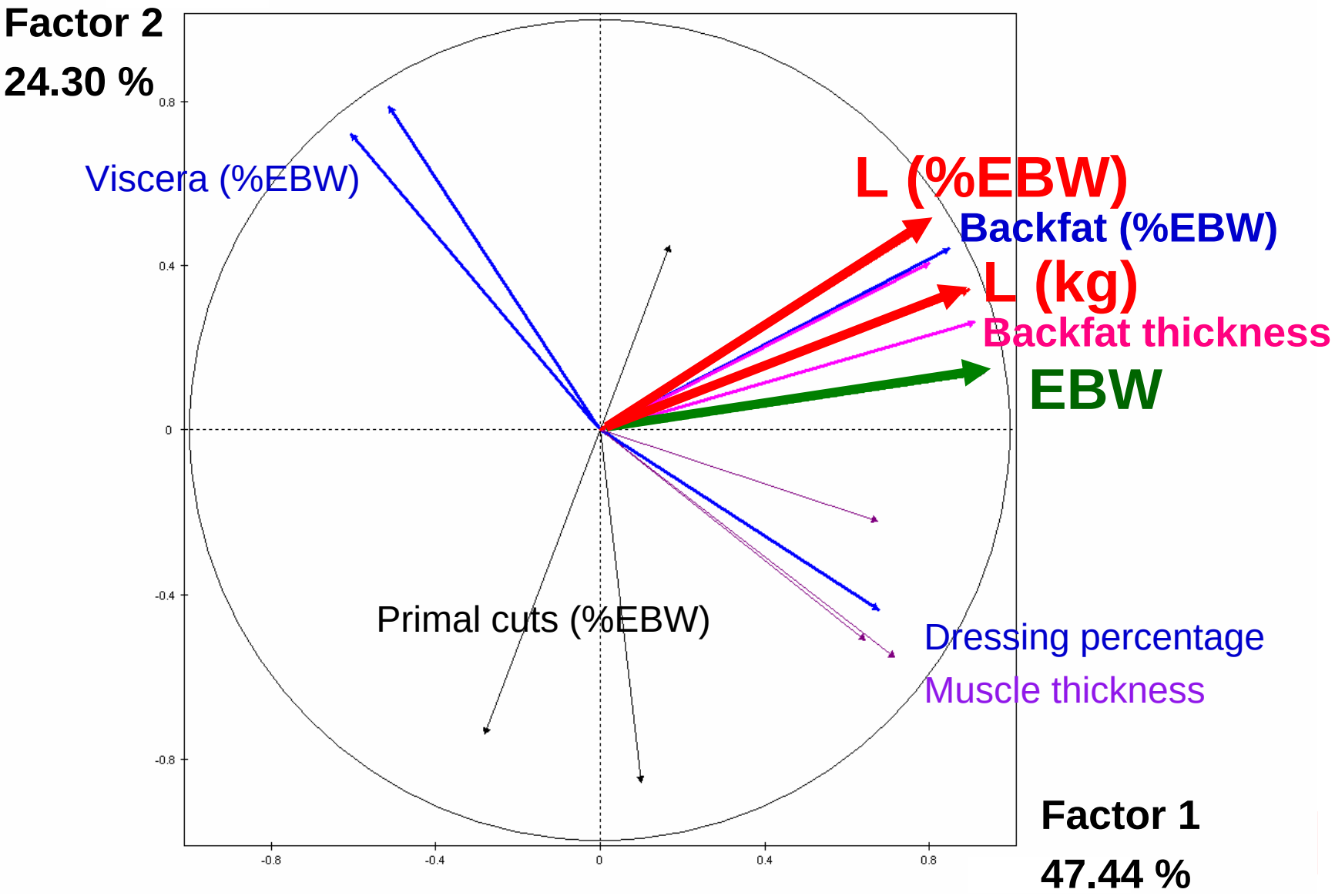
Chemical analysis of the whole animal

Relation between lipid mass (kg) and empty body weight (EBW, kg)

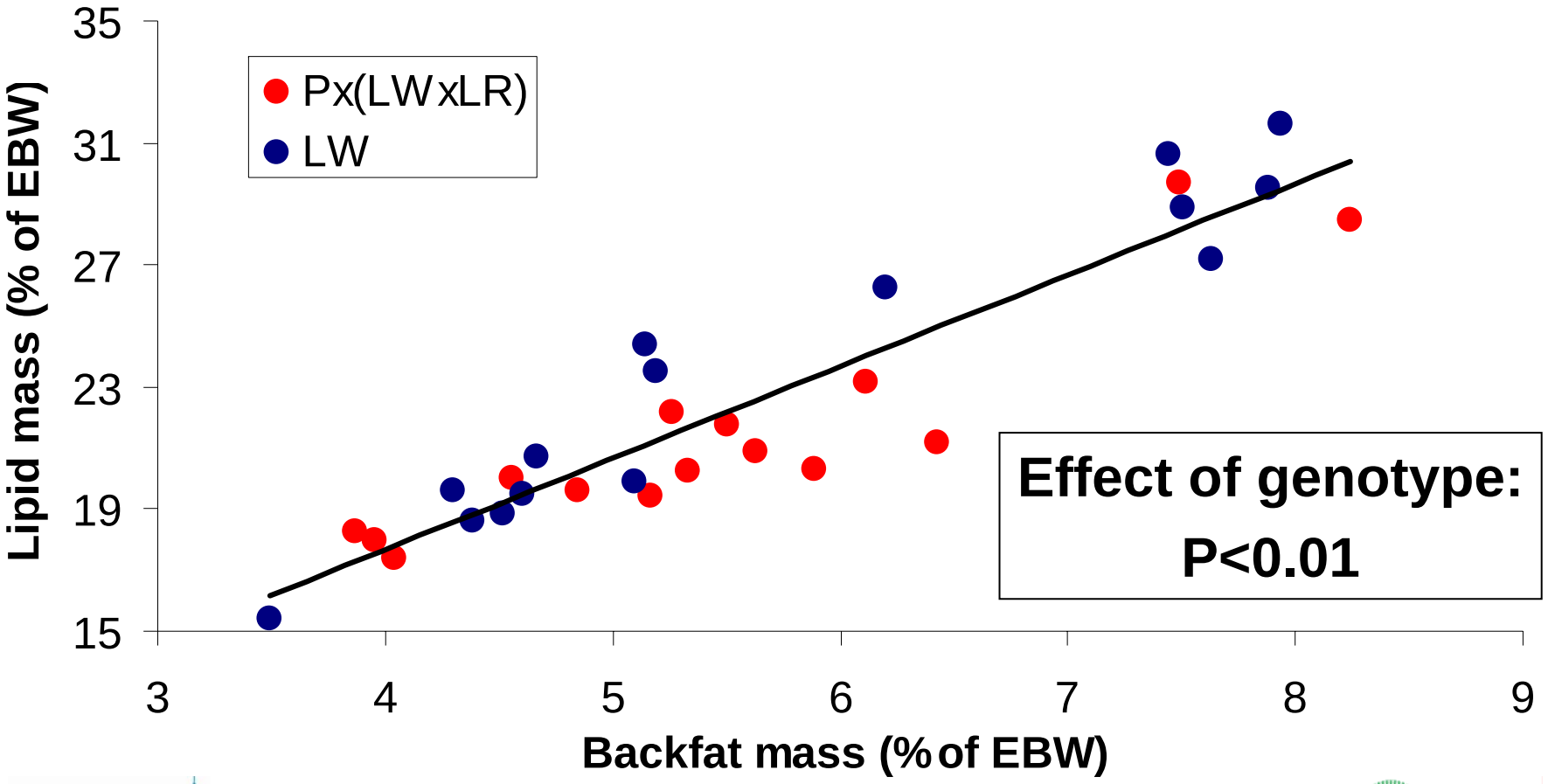
$$L = 7.04 \times 10^{-3} \times EBW^{1.73} \quad (R^2 = 0.87)$$



The possible simple indicators for L



Backfat mass (% of EBW) is the best simple indicator for the lipid mass (% of EBW)



Advantages of measuring backfat thickness

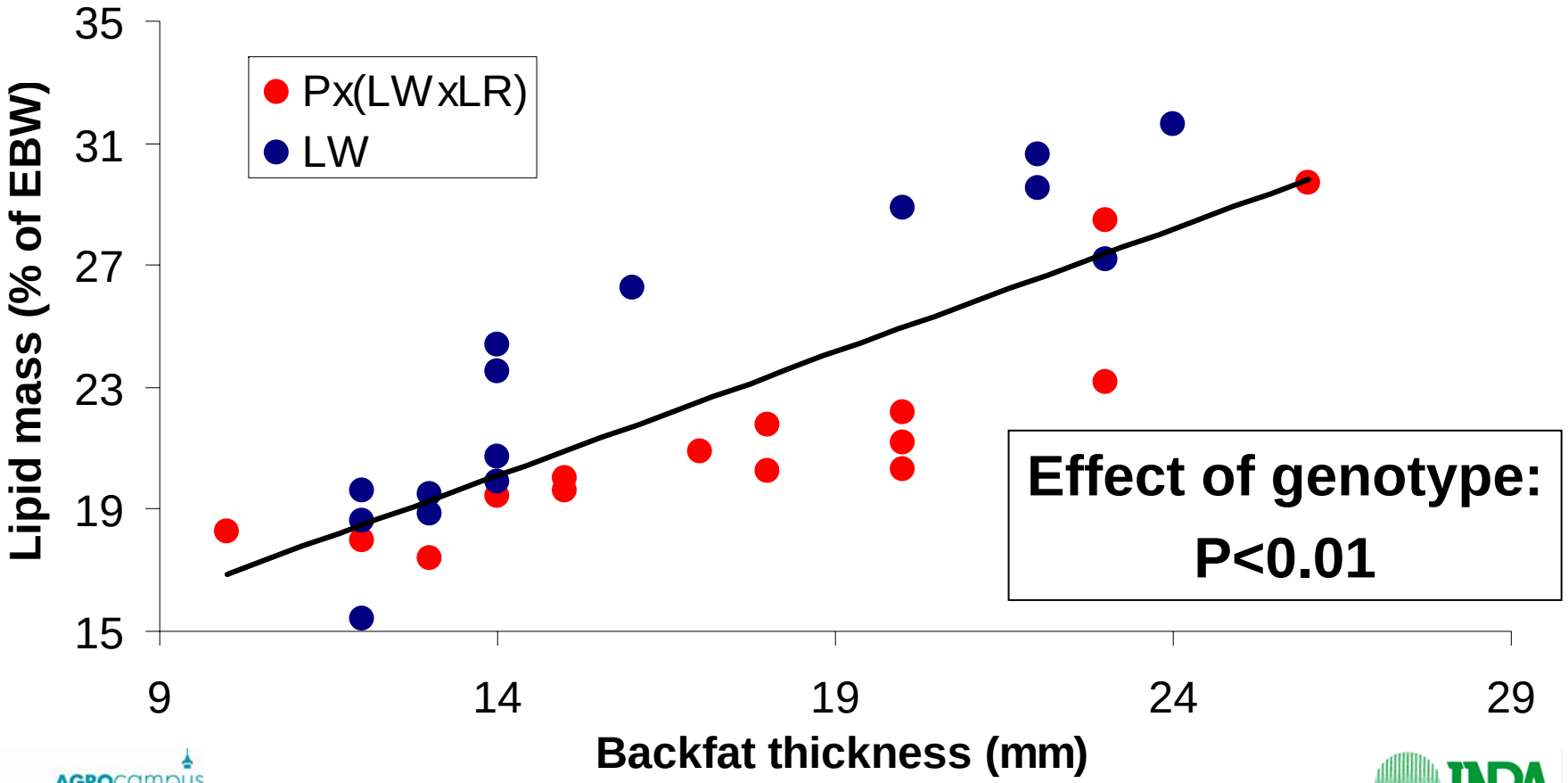
- **preserves the value of the product**
- **easily accessible (*in vivo* or at slaughter)**
- **representative for backfat mass (B):**

The relationships between B and backfat thickness :

- *in vivo* : $0.71 < R^2 < 0.74$
- hot carcass : $0.82 < R^2 < 0.86$
- cold carcass : $0.83 < R^2 < 0.86$

The second best indicator for lipid mass (% of EBW) is the backfat thickness

Measured in the hot carcass between 3rd and 4th last lumbar vertebra at 8 cm off the mid line



Three relations estimating lipid mass (L, kg)

1/ Allometric relation (EBW)

$$L = 7.04 \times 10^{-3} \times EBW^{1.73} \quad (R^2 = 0.87)$$

2/ Backfat mass in combination with EBW

$$L = (0.0590 + 2.99 \times B\%EBW) \times EBW \quad (R^2 = 0.96)$$

3/ **Backfat thickness** measured in the hot carcass between 3rd and 4th last lumbar vertebra at 8 cm off the mid line **in combination with EBW**

$$L = (0.0854 + 0.0073 \times \text{backfat thickness}) \times EBW \quad (R^2 = 0.94)$$

Genotype affected these relations

Conclusions

Measurements on external fat tissues explain a considerable part of the variation in lipid mass

Body lipids distribution differs between genotypes

Additional genotype-specific information would improve the accuracy of the prediction