

## Prediction of live body weight using length and girth measurements for pigs in rural western Kenya

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### Objectives

The objective was to develop and validate weight estimation models for small-scale pig farmers to estimate the weight of their pigs.

### Methodology

A random sample of 287 pig farmers in two districts of Western Kenya was studied. Farmers were asked to estimate pigs age (months) and weight (kg). Pigs were weighed (kgs) and the length and girth measurements were taken (cms) using ordinary tape measures. Data were managed and analysed in Stata®. Pigs were categorized by age; young pigs before the typical market weight ( $\leq 5$  months), typical marketing age but prior to breeding ( $>5$  and  $< 10$ ) and mature breeding age ( $\geq 10$  months). Using 75 % of the data, models were developed for young, market, and breeding age pigs. Weight was regressed on length and girth measurements using linear regression in a mixed model analysis, controlling for the random effect of village. Validation was done using 25 % of the data. Differences between the actual pig weight and the predicted weights were determined and compared (using paired t tests). The difference between the farmers' estimate and the actual pig weight were further compared.

### Results

A total of 840 pig observations were made, including 363 (young pigs), 305 (market-age pigs) and 172 (breeding-age pigs). The young, market and breeding pigs weighed on average 12 (+6), 30 (+11), and 42 (+17) kg respectively. Pig weight increased with increasing age. The length and girth explained 88 - 91 % of the total variation in weight. The models were as follows; young pig weight =  $[0.18 (\text{length}) + 0.36 (\text{girth}) - 16]$ ; market age pig weight =  $[0.39 (\text{length}) + 0.64 (\text{girth}) - 48]$ ; breeding pig weight =  $[0.36 (\text{length}) + 1.02 (\text{girth}) - 48]$ . The weight estimated by the model did not differ from the actual weight ( $P > 0.05$ ), whereas the farmer's guess was lower than the actual weight ( $P < 0.05$ ). The median differences between the model prediction versus the farmer's estimate and the actual weight ranged from -0.6 to 1.3 kg versus 3.5 to 7 kg.

### Discussion and conclusion

Rural pig keeping is a pathway out of poverty; knowledge of the pigs estimated weight will empower farmers to have better bargaining power when selling pigs. Estimating a pig's weight by `just looking at the pig` usually provides unreliable weight estimates. By adapting this tool, rural pig farmers, particularly women, will benefit from better market value for their pigs and thereby a realization of greater returns from the sector.