Culling risks for served females and farrowed sows at consecutive parities in served gilt cohorts in commercial herds

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Introduction
✓ A culling decision in everyday practices is critical for retention patterns and financial performance in breeding farms.
✓ Log-binomial regression models with relative risk ratios is recommended to use in cohort studies, rather than logistic regression models with odds ratios 1.

Objectives
1) to characterize culling and retention patterns from parities 0 to 6 in both served females and farrowed sows in two herd productivity groups
2) to quantify the factors associated with by-parity culling risks for both of the served females and farrowed sows using log-binomial regression models.

Materials and methods
Farms
☐ Data collected from 98 Spanish farms cooperating with the consultancy firm PigCHAMP pro Europa S. L. (Segovia, Spain).

Performance data
☐ We analyzed 465,974 service records of 94,691 females served between 2008 and 2013.

Definitions and categories
☐ By-parity culling risk (%) for pigs served and sows farrowed were defined as the number of culled divided by the number of female pigs served and sows farrowed, respectively, at that parity x 100.
☐ By-parity retention rate was defined as the number of sows successfully reached the farrowing at the next parity divided by the number of gilts first-served.
☐ Farms were categorized into two groups based on the upper 25th percentiles of the farm means of annualized lifetime pigs weaned per sow: high-performing and ordinary farms.

Statistical analysis (SAS)
☐ Two-level log-binomial regression models were used to examine risk factors and risk ratios associated with by-parity culling risks for served females and farrowed sows.

Results
➢ Retention rates by parities 1, 2 and 3 were 92.7, 80.9 and 72.2%, respectively.
➢ For farrowed sows, increased culling risks were associated with sows farrowed 8 or fewer pigs born alive, sows being fed in high-performing farms and sows farrowed 3 or more stillborn piglets (P < 0.05).
➢ Sows farrowed 8 or fewer pigs born alive in high-performing herds had 5.0-11.4% higher culling risks than those in ordinary herds (P < 0.05; Fig. 2).
➢ The relative risk ratios for culling were 3.52-4.11 for sows having 8 or fewer pigs born alive, 1.30-1.52 for sows fed in high-performing farms, and 1.53-1.58 for sows farrowed 3 or more stillborn piglets, compared to the respective reference sows that farrowed 16 pigs or more, were fed in ordinary farms and farrowed 0 stillborn piglets.
➢ Also, increased culling risks for served sows were associated with sows having a weaning-to-first-service interval (WSI) of 7 days or more (P < 0.05).
➢ The relative risk ratios in culling for sows having WSI 7 days or more were 1.56-1.84 across parities, compared to the same parity sows having WSI 0-6 days.

Conclusions
It is recommended that producers improve management for sows farrowing stillborn piglets and having prolonged WSI and not readily cull sows at mid-parity sows having fewer pigs born alive in order to achieve high retention and high longevity of sows and maximize their reproductive potential.

Reference