Published April 22, 2016

EXTENSION- SWINE

073 Impact of piglet birth weight increase on survivability and days to market, a simulation model. J. Jourquin[1,*], J. Morales[2], C. D. Bokenkroger[3], *[1]Elanco, Antwerpen, Belgium, [2]PigCHAMP Pro Europa, Segovia, Spain, [3]Elanco Animal Health, Greenfield, IN.*

As a result of high prolificacy in sows, piglet birth weight is decreasing by 25 to 35 g per extra pig in the litter while its variability is increasing. Piglets under a birth weight threshold of 1.13 kg are pigs at risk. They have low survival chances and need more days to market. The objective of the simulation model was to determine the impact of individual birth weight increase on survivability and days to 100 kg. From 3 farms located in Spain, 2331 piglets from 178 litters were followed from birth to slaughter or moment of death. Litter parameters were collected. The pigs were weighed at birth, weaning, end of nursery, end of growing, and on the day before the first pigs of the batch went to slaughter. If the pig died, the date, weight, and cause were recorded. The pigs were categorized in increasing birth weight classes of 100 g. For each class, frequency, mortality, and days to 100 kg were calculated. To each birth weight class, 100, 150 or 200 g was added, and the mortality and days to 100 kg were recalculated. Litter size was 14.3 total born and 13.1 live born. The average birth weight was 1.46 kg. Eighty-three percent of the pigs made it to harvest. By increasing the birth weight class by 100, 150, and 200 g, the survival rate would increase to 85.6, 86.6, and 87.6%, respectively, or 0.34, 0.47, or 0.60 piglets per litter. The litter weight at birth would increase from 19.2 to 20.5, 21.1, and 21.8 kg, respectively. Time to reach 100 kg would decrease from 178.7 d to 176.1, 174.5, and 172.9 d, respectively. Preweaning survival chances of pigs at risk (< 1.13 kg) are low (58%) compared to the other piglets (92%). By increasing the birth weight of the piglets proportionally, survivability increases are more pronounced in the low birth weight range, and this could potentially bring the average growth rate down. However, in the model, the time to market still decreased marginally. As a result, more pigs would reach the market without a negative impact on time to market. The model used suggests that increasing birth weight proportionally has a positive impact on survivability without having a negative impact on the number of full value pigs to slaughter.

Key Words: birth weight, days to market, survivability

doi: 10.2527/msasas2016-073

074 Birth weight threshold for identifying piglets at-risk for preweaning mortality. J. A. Feldpausch[1,*], J. Jourquin[2], J. R. Bergstrom[3], C. D. Bokenkroger[4], J. L. Nelssen[1], M. J. Ritter[4], D. L. Davis[1], J. M. Gonzalez[1], *[1]Kansas State University, Manhattan, [2]Elanco, Antwerpen, Belgium, [3]DSM Nutritional Products, Parsippany, NJ, [4]Elanco Animal Health, Greenfield, IN.*

The association of piglet birth weight (BtW) with early-life mortality risk is strongly supported by research of numerous studies reporting decreased preweaning piglet mortality as individual piglet BtW increases. The purpose of the present analysis was to identify a BtW threshold associated with reduced odds of preweaning survival. Observations from 2 studies with a total of 4068 piglets originating from 394 litters on 4 different commercial farms (3 European, 1 U.S.) were compiled for meta-analysis. Overall preweaning mortality rate across all farms was 12.2%. Data used in the analysis was weight of piglets within 24 h of birth and their corresponding survival outcome (dead or live) by weaning at 3 to 4 wk of age. A mixed effects logistic regression model was fit to estimate the probability of preweaning mortality based on BtW. A random effect of study was included to account for overall differences in mortality between the 2 studies. A piecewise linear predictor was selected to best represent the drastic decrease in preweaning mortality found as BtW increased in the range of 0.5 to 1.0 kg and the less extreme change in preweaning mortality observed for changes in weight above 1.0 kg. The model change point was determined by comparing model fit for BtW ranging from 0.5 kg to 2.0 kg based on maximizing the likelihood. A linear predictor equation was also generated to estimate the associated preweaning mortality probability associated with every 50 g of piglet BtW. Results indicated a 1.11 kg BtW change point in the log odds of piglet preweaning mortality, thus, implicating that every incremental change in BtW below 1.11 kg has a greater impact on mortality risk than incremental changes in BtW above 1.11 kg. Among the farms in this analysis, 14.9% of all piglets had BtW < 1.11 kg. These findings imply that interventions targeted at increasing the BtW of piglets having BtW less than 1.11 kg have tremendous potential to improve piglet preweaning survivability. A large percentage of the neonatal pig population falls below this weight threshold, and postnatal management strategies to decrease neonatal mortality should be directed toward these at-risk piglets.

Key Words: birth weight, piglet, preweaning mortality

doi: 10.2527/msasas2016-074