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Original scientific paper

GROWTH OF WEANED PIGS AND CORRELATION BETWEEN LIVE BODY WEIGHT GAIN AT THE START AND FINISH OF REARING PERIOD

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Summary

In the intensive swine industry study of age-related growth rates is a prerequisite for successful production. Thus, in a large swine pupulation with homogeneous breed/sex composition it is important to know the possibilities of growth in all age groups of pigs to attain management related to the expected production. To determine possible correlation between age and live body wight gain of pigs (of both sexes) during the rearing period we have used data of individual weighing in 7-day intervals. The pigs were fed standard feed mixtures *ad libitum* during the experiment. Preliminary data concerning age-related growth of rearing pigs indicate that the pigs 24.34 ± 0.02 days old (ranging from 19 to 29 days) weighed on average 5.46 ± 0.1 kg (ranging from 3.5 to 8.3 kg) at weaning. At the end of the rearing period pigs were 80.34 ± 0.27 days old (ranging from 75 to 85 days) and weighed on average 20.10 ± 0.43. We have obtained significant positive correlation($r = 0.538$; $P < 0,01$) and regvession line for live body weight gain in 80-day-old pigs depending on their live body weight gain at 24 days ($Yc = 7.06 + 2.39\ x$). There is no significant correlation between sex anda live body weight change.

Key words: correlation, age related growth, live body weight, postweaning pigs.

Introduction

It is important to know the properties decisive for the production and breeding performance in the intensive swine industry. Characteristics of growth rate are one of them. Definition of growth correlates body-mass increase with time periods. In large swine populations with homogeneous breed and sex composition, it is important to know the possibilities of growth in all age groups of pigs to attain management related to the expected production. In the previous study (Sviben, 1993.) it was determined that a strong correlation ($r = 0.617 \pm 0.05$) exists between live body weights of 159- to 164-day-old-pigs and 4-day-old pigs. Concomitantly, a strong linear correlation ($r = 0.736 \pm 0.03$) between age groups of young boars of 30 and 90 kg live body weight was determined. It is generally accepted that the fattening period begins at 20 kg of

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live body weight. According to Sviben (1989). 70-day-old pigs weigh 20.937 kg on average.

The aim of this study was to determine the growth rate in pigs from weaning to the end of the rearing period with possible assessment of growth rate capabilities of weaners.

Materials and methods

The study was performed in a large-scale swine farm with the production of 6000 pigs per year. According to rearing management. Swedish Landrace x Large White sows were mated with Germane Landrace boars. In the farrowing unit there were 18 prepartient sows, which produced 137 weaned pigs. In rearing 23 pigs were lost. Weighing was performed in seven day intervals during the rearing period. All the pigs were fed with commercially available feed mixtures *ad libitum*. Data were statistically analyzed using the previously described test (Snedecor, Cochran, 1979.)

Results

The results obtained for live body weight and age of 114 rearing pigs are presented in Table 1.

Table 1. - AGE AND LIVE BODY WEIGHT IN PIGS AT THE BEGINNING AND AT THE END OF THE REARING PERIOD (N = 114)

Property	X_{min}	X_{max}	$\bar{X} \pm$ S. E.	s
Beginning of the rearing period - age (days)	19	29	24.342 ± 0.235	2.513
- live body weight (kg)	3.5	8.3	5.460 ± 0.098	1.043
Ending of the rearing period - age (days)	75	85	80.342 ± 0.271	3.600
- live body weight (kg)	6	29	20.096 ± 0.434	23.000

Significant positive correlation ($r = 0.537$; $P < 0.01$) was obtained from the data presented in Table 1. We obtained regresion line (Fig. 1.) for live body weight in 80-day old pigs depending on their live body weight on 24th day ($Yc = 7.0598 + 2.3873\ x$).

Fluctuation of the average live body weight and absolute gain of pigs during the whole rearing period is presented in Figure 2. First (postweaning) period is characterized by the decline of live body weight (0,3 kg), but after that a relatively constant increase can be seen.

Having in mind possible differences between the growth rate of male and female pigs, we examined the live body weight of both sexes separately at the begining and at the end of the rearing period (Table 2.). No significant differences were found ($P > 0.05$) and the correlation coefficient between the starting and the ending live weight in the rearing period was quite similar ($r = 0.543$; $P < 0.05$ for male pigs and $r = 0.555$; $P < 0.05$ for female pigs).

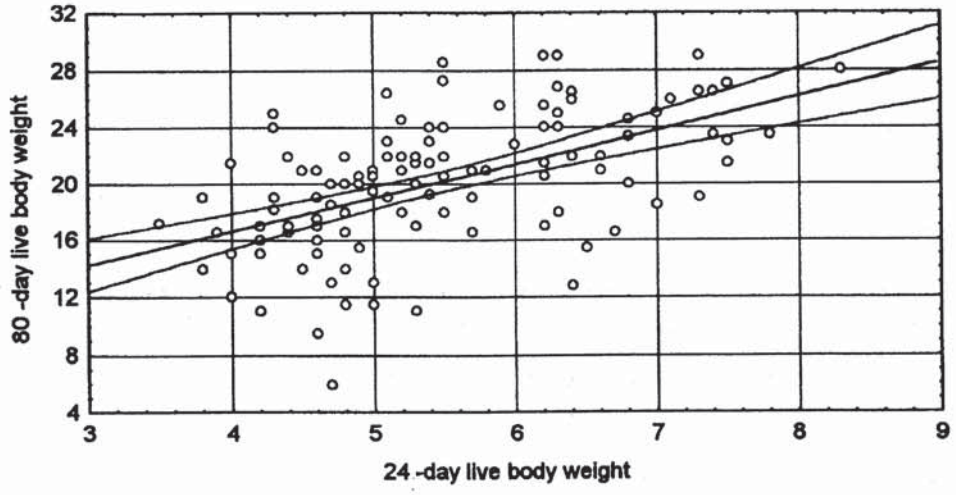

FIGURE 1. - CORRELATION OF 80-DAY AND 24-DAY LIVE BODY WEIGHT IN PIGS
80-day live body weight = 7.0598 + 2.3873 x 24-day live body weight r = .53755

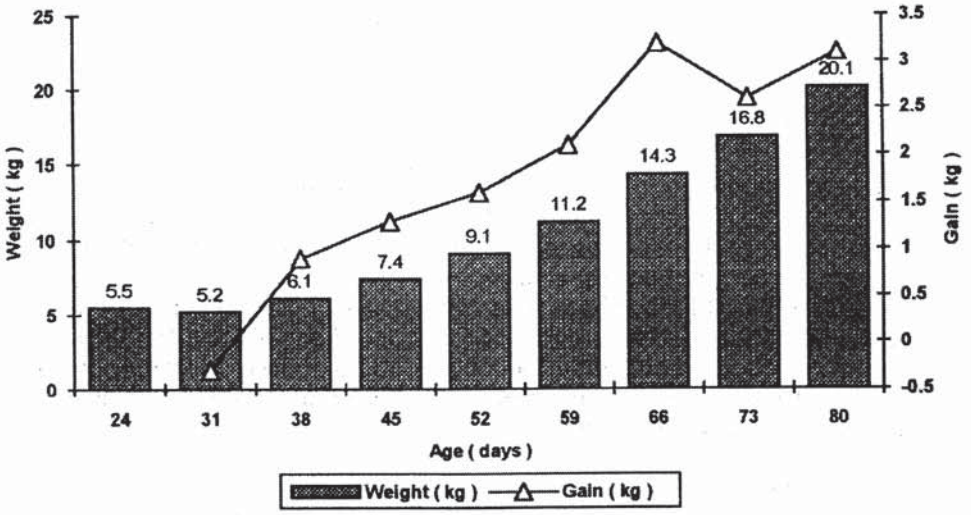

FIGURE 2. - AVERAGE LIVE BODY WEIGHT AND GAIN OF PIGS DURING THE REARING PERIOD

Table 2. - LIVE BODY WEIGHT IN PIGS OF BOTH SEXES ON DAY 24 (I) AND DAY (II).

Group	n	X_{min}	X_{max}	$\bar{X} \pm$ S. E.	s
I					
- male	61	3.5	7.8	5.498±0.143	1.114
- female	53	3.9	8.3	5.417±0.132	0.963
II					
- male	61	11.5	29.0	19.939±0.528	4.126
- female	53	6.0	29.0	20.275±0.712	5.186

Variations of weight and gain between male and female pigs during the rearing period (Table 3.) were also small and not significant ($P > 0.05$).

Table 3. - LIVE BODY WEIGHT AND GAIN IN PIGS DURING THE REARING PERIOD

Age (days)	Live weight (kg)			Gain (kg)		
	Male	Female	Both sexes	Male	Female	Both sexes
24.	5.5	5.4	5.5			
31.	5.2	5.1	5.2	-0.3	-0.3	-0.3
38.	6.2	6.1	6.1	0.9	1.0	0.9
45.	7.4	7.4	7.4	1.2	1.3	1.3
52.	9.1	9.0	9.1	1.7	1.6	1.6
59.	11.2	11.1	11.2	2.1	2.1	2.1
66.	14.4	14.3	14.3	3.2	3.2	3.2
73.	16.7	16.9	16.8	2.5	2.8	2.6
80.	19.9	20.3	20.1	3.0	3.2	3.1

Discussion

Characteristics of growth at the beginning of the rearing pariod (day 24) could be compared to the growth rate of control pigs (Matulis et al., 1987) which had 5.9 kg live body weight on day 28 and with previous investigations ((Ferić, 1989.) where the average live body weight of pigs of the same age category was 5.1 kg. The linear correlation coefficient for live body weight of 24- and 80-day-old pigs ($r = 0.538$) is similar to those (Ferić, 1989.) obtained for 14- and 42-day-old-pigs ($r = 0.569$) and 14- and 49-day-old-pigs ($r = 0.395$). The correlation coefficient of 24- and 80-day-old-pigs implies that change in live body weight of 80-day-old-pigs proportionally corresponds to the weight of 24-day-old pigs.

Conclusions

1. The live body weight gein of 80-day-old-pigs proportionally corresponds to the weight of 24-day-old-pigs.
2. The obtained linear correlation is strong, pòsitive and significant.

3. There is no significant correlation between sex and live body weight change.

References

1. Ferić, Z. (1989): Ph. D. thesis, Osijek, Croatia.
2. Matulis, R. J., F. K. McKeith, P. J. Bechtel, J. E. Novakovski and D. G. McLaren (1987); J. Anim. Sci. 65 (1), 249.
3. Snedecor, G. and W. Cochran (1979): Statistical methods. The Iowa State University Press. Ames, I0
4. Sviben, M. (1989): Pig-breeding, Zagreb, Croatia, pp. 1044-1062.
5. Sviben, M. (1993): On Large Whites, the Conception and the Realization of Breding in the Swine Enterprise "Belje", Zagreb, Croatia.

RAST ODBIJENE PRASADI I POVEZANOST ŽIVE MASE TIJELA NA POČETKU I ZAVRŠETKU ODGOJA

Sažetak

Za uspješan rad u intenzivnoj svinjogojskoj proizvodnji potrebno je poznavati osobine koje su presudne za proizvodne i uzgojne učinke. To je i osobina rasta.

Rast je definiran kao uzajamno povezano povećanje tijela u ograničenim vremenskim razdobljima. U velikim populacijama svinja, gdje je pasminski sastav ujednačen, a spol životinja ravnomjerno zastupljen važno je znati mogućnosti rasta životinja u svim stadijima života, kako bi bilo moguće prilagoditi postupanje sa životinjama prema očekivanim rezultatima.

Istraživanja su obavljena na farmi čija je proizvodnja organizirana na industrijski način.

Prema uzgojnom programu upotrijebile su se svinje pasmine švedski landras, veliki jorkšir te njemački landras.

Rezultati istraživanja osobine rasta s obzirom na dob odgajane prasadi pokazuju da je starost prasadi pri odbiću varirala u rasponu od 19 do 29 dana s prosječnom dobi od 24, 342±0,023 dana. U toj dobi prosječna masa tijela iznosila je 5,460±0,098 kg, a u rasponu od 3,5 do 8,3 kg.

Pri završetku odgoja prasad je bila stara u prosjeku 80,342±0,271 dana, u rasponu od 75 do 85 dana i pri tome je bila teška 20,096±0,434 kg. Najlakša prasad težila je 6 kg, a najteža 29 kilograma. Da bi se utvrdila moguća povezanost mase tijela prasadi tijekom odgoja, provedeno je pojedinačno vaganje prasadi u razmacima od 7 dana.

Postignuta je značajna pozitivna povezanost ($r = 0.538$; $P < 0,01$) i linija regresije ($Yc = 7,06 + 2,39x$) za živu masu tijela 80 dana stare prasadi u odnosu na tijelesnu masu u dobi od 24 dana. Nije bilo značajne razlike između spolova.

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