DOI: 10.2478/v10083-012-0023-z

ANNALES
UNIVERSITATIS MARIAE CURIE-SKŁODOWSKA
LUBLIN – POLONIA

VOL. XXX (3) SECTIO EE 2012

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Organization of pig production and breeding in the Wielkopolska region in 2000–2010

Organizacja chowu i hodowli trzody chlewnej w Wielkopolsce
w latach 2000–2010

Summary. The performed data analysis demonstrated a change in the breeding structure and swine population in the region of the Wielkopolska Voivodeship which was influenced directly by cyclic fluctuations in the relationships between feed and agricultural production inputs and prices offered for live slaughter animals. The supply surplus of fatteners resulted in dramatic lowering of the purchase prices, while reduced supplies led to growing purchase prices. Therefore, a characteristic instability of swine populations as well as purchase prices – known as the so-called "swine cycles" – were noticeable not only in the Wielkopolska Voivodeship but also in the entire country. During the examined period of time from 2000 to 2010, a steady increase was observed in the Wielkopolska Voivodeship in the average number of sows in herds, which ranged from 25 to 50. Despite unfavourable conditions in the swine sector, in the examined period of time, the above-mentioned region was characterised by the highest population of pigs in Poland. On average, it constituted over 27% of the total pig population in the country.

Key words: rearing, breeding, swine population, Wielkopolska Voivodeship

INTRODUCTION

Rearing and breeding constitute two directions in animal production which are connected inseparably and it is impossible to carry out one of them without involvement of the other. In the course of the last several years, considerable changes could be observed in swine rearing and breeding both in the region of Wielkopolska as well as in other

parts of the country. Swine production in years 2000–2010 was conducted in conditions of cyclic economic fluctuations made even worse by overlapping seasonal changes. These instabilities could be attributed to many different reasons, among others, to geographic-natural, climatic, organisational, veterinary, market, political as well as other factors. Their mutual interrelationships and cooperation strongly influenced the economy of swine rearing. Lack of stability of swine production profitability affected fluctuations in swine populations. The objective of the presented study was to analyse changes that occurred in swine rearing and breeding in Wielkopolska Voivodeship during the period from 2000 to 2010.

MATERIAL AND METHODS

The performed analyses comprised data concerning the state of swine rearing and breeding as well as reproduction, fattening and slaughter performance of all breeds and lines found in Wielkopolska Voivodeship in years 2000–2010. The documentary materials derived from the State Centre of Animal Breeding of the Polish Association of Swine Breeders and Producers "POLSUS", Institute of Animal Husbandry – PIB in Balice as well as our own observations and measurements carried out at the Department of Pig Breeding and Production, Poznań University of Life Sciences.

The following methods and parameters were taken into account in the course of the performed analyses:

1. Assessment of the reproduction performance of sows expressed as live productivity:
– number of piglets born alive and raised in a litter up to the 21st day of life (heads),
– age at first farrowing (days),
– period between farrowings (days).
2. Live assessment of young boars and breeding gilts:
– standardised daily body weight gain (g),
– average backfat thickness (mm),
– loin 'eye' height (mm),
– percentage meat content in the carcass [Eckert and Szyndler-Nędza 2010, Eckert and Żak 2010].

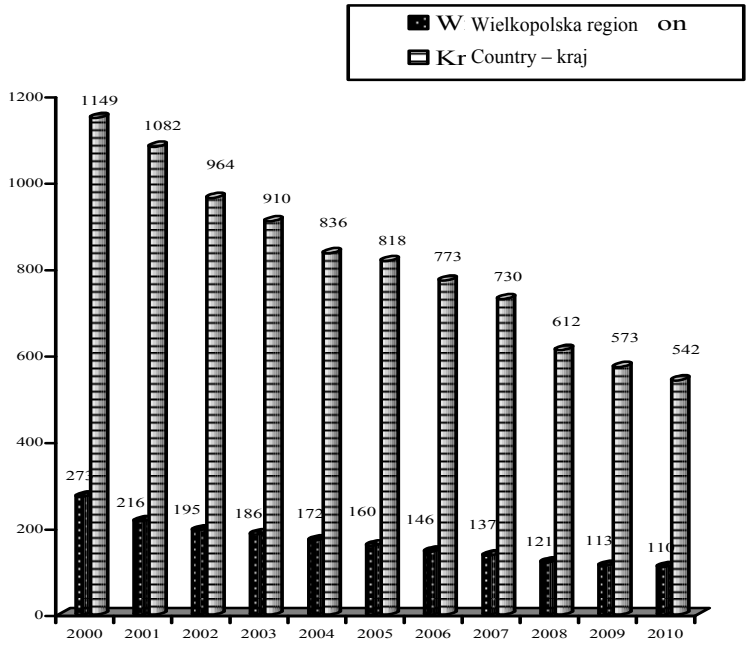
The results were collated as arithmetic means and presented in the form of tables and graphs.

RESULTS

In the course of the examined 11 years, i.e. from 2000 to 2010, administrative changes took place in the structure of pig breeding. At the present time, swine breeding is supervised and managed by the State Centre of Animal Breeding (SCAB). In 2003, keeping of herd-books as well as the assessment of the breeding value of the following breeds: Large Polish White (WBP), White Polish Landrace (PBZ), Hampshire (HAMP), Duroc (DUR), Pietrain (PIET), Belgian landrace (BZ) and Puławy (PUŁ) were taken over by the Polish Association of Swine Breeders and Producers "POLSUS". In the case of Złotnicka white (ZŁB) and Złotnicka spotted (ZŁP) breeds, the above tasks were

taken over by the University of Life Sciences in Poznań. The Institute of Animal Husbandry – PIB in Balice supervises the Program of Protection of Genetic Resources of Farm Animals for ZŁB, ZŁS and PUŁ breeds and keeps herd-books for the 990 line.

In the course of the analysed period of time, seven swine breeds and one pig line 990 were kept in Wielkopolska Voivodeship for which herd-books were kept and sows from the pedigree breeding underwent evaluation. Both in Wielkopolska Voivodeship as well as in the entire area of Poland, beginning with the year 2000, a steady decline in the number of herds which were subjected to assessment was observed (Graph 1). In 2000, the number of herds in Wielkopolska amounted to 273 which constituted approximately 24% of all swine herds in Poland. The most numerous breed in Wielkopolska was the WBP breed whose share made up nearly 41% of all breeds reared in this area. In the following year, the most numerous breed in this voivodeship was PBZ (40.7%) which overtook the WBP breed by 0.5%. From the year 2002 onwards, the WBP breed remained dominant in Wielkopolska Voivodeship.

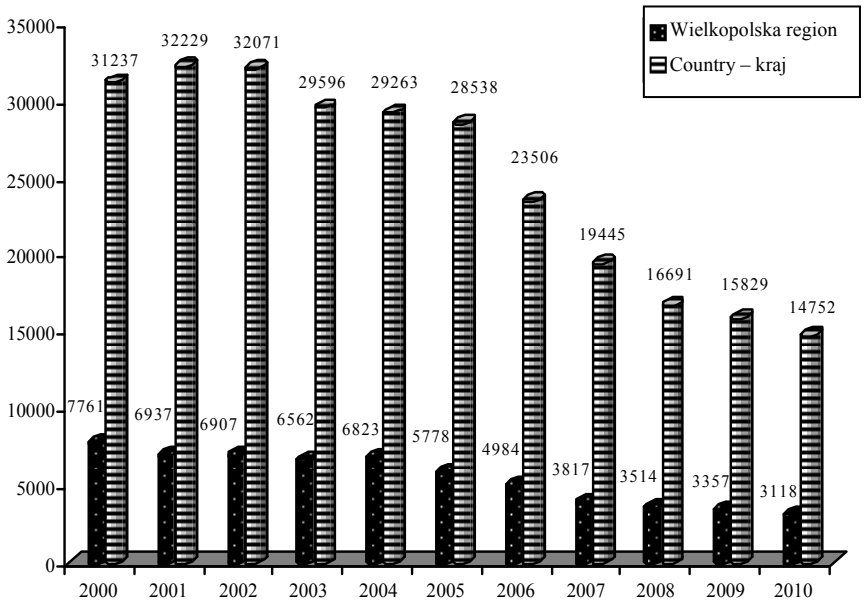


Data from/Dane z CBI PZHiPTCh "POLSUS"

Graph 1. Number of herds tested in Wielkopolska region and the country
Wykres 1. Liczba stad będących pod oceną w Wielkopolsce oraz na terenie całego kraju

In the course of the studies eleven years, a distinct drop in numbers of sows under assessment was observed together with a decline in the number of herds (Graph 2). The number of sows in the pedigree breeding in Wielkopolska Voivodeship as of December, the 31st 2000 amounted to 7761 and showed a declining trend until 2003. In the year

2004, a slight increase in numbers of sows was recorded (by 261 sows) but it was the only year when their numbers increased during the studied period of time. All the remaining consecutive years revealed an unfavourable declining tendency which was reflected in the number of sows which, on day 31.12.2010, declined to just 3118 heads. It can be presumed that one of the main causes of this phenomenon was cessation of direct herd subsidy. Following recent economic uncertainties, many breeders abandoned involvement in pedigree breeding, while others reduced the size of their herds.



Data from/Dane z CBI PZHiPTCh "POLSUS"

Graph 2. Number of sows evaluated with respect to their reproduction performance traits in Wielkopolska region and the country
Wykres 2. Pogłowie loch objętych oceną użytkowości rozpłodowej w Wielkopolsce oraz na terenie całego kraju

Another noticeable trend was a fluctuating relationship observed in the studied period between the number of sows intended for the production of young boars and gilts in comparison with the sows producing exclusively gilts (Tab. 1). Additionally, development of artificial insemination also contributed to a reduced demand for boars which found its direct reflection in the reduction of herds producing them.

No significant changes were recorded in Wielkopolska Voivodeship in the period of eleven years with respect to the swine breed structure. In addition, proportions in the numbers of evaluated sows in individual breeds also remained fairly stable. The only exception deserving attention was a significant decrease in the number of Hampshire breed sows. In 2000, there were 184 sows of this breed and four years later, on December, the 31st 2004, their number dropped to 100 heads, which means that in four years

their number declined by about 46%. The cause of this considerable decline was not a crisis but rather resignation of many breeders from rearing sows of this breed due to a lack of interest of buyers in this kind of breeding material. In years 2009 and 2010, no evaluated herds of Hampshire breed sows were recorded in Wielkopolska Voivodeship.

Table 1. Number of sows producing young boars and gilts and population of sows producing only gilts in years 2000–2010 in Wielkopolska region
Tabela 1. Pogłowie loch produkujących knurki i loszki oraz loch produkujących wyłącznie loszki w latach 2000–2010 w Wielkopolsce

Sows/Lochy	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sows producing young boars and gilts (heads) Lochy produkujące knurki i loszki (szt.)	3138	3053	3028	3246	3710	2542	2462	1886	1792	1736	1741
Sows producing gilts (heads) Lochy produkujące loszki (szt.)	4623	3884	3879	3316	3113	3236	2522	1931	1722	1621	1377

Data from/Dane z CBI PZHiPTCh "POLSUS"

The observed phenomenon of decreasing number of herds was accompanied by changes in the concentration of animals in the remaining herds. The herd structure in the year 2000 was as follows: the highest number of herds, i.e. 149, kept 21–50 sows constituting nearly 57% of all herds in this region. Less than 5% of the examined herds (the lowest number) comprised herds which reared from 51–100 or more sows. One year later, herds of sows consisting of 15 to 26 sows were in majority (92 herds). In the same year, herds comprising 25–50 sows constituted 34% of all herds, whereas herds which did not exceed 14 sows constituted 14% of all herds in Wielkopolska Voivodeship with the total number of herds of 216. In 2002, the structure of herd concentration improved; out of 195 herds recorded in this region, 114 herds maintained 25 to 50 sows. However, the crisis that took place in swine breeding and production resulted in the inhibition of the increase in numbers of sows in herds.

The evaluation of the reproduction performance includes all sows in breeding herds of pure breeds as well as line 990 with respect to the following traits: number of piglets born alive and raised in a litter up to the 21st day of life, age at first farrowing and the period between farrowings. From the economical point of view, one of the most important indices of the reproduction performance is the number of piglets reared from one sow per year. In the case of Wielkopolska Voivodeship, the highest number of piglets born alive and raised up to day 21 of life was recorded for sows of maternal lines, i.e. of WBP and PBZ breeds. These values amounted to, respectively: WBP – 11.44 and 10.78 heads and PBZ – 11.35 and 10.77 heads. The earliest first litter was recorded from sows of the PBZ breed – on average, in the 346th day of life. In the course of the examined eleven years, the shortest average inter litter period of 160 days was recorded in the case of sows from line 990 (Tab. 2 and Tab. 2a).

Table 2. Average results of reproduction performance evaluation of different breeds of sows in Wielkopolska region in the period from 1.01.2000–31.12.2010

Tabela 2. Średnie wyniki oceny użytkowości rozpłodowej loch poszczególnych ras w Wielkopolsce w okresie od 1.01.2000–31.12.2010

Year/Rok	Number of piglets born alive (heads) Liczba prosiąt żywo urodzonych (szt.)								Number of piglets on day 21 (heads) Liczba prosiąt w 21. dniu (szt.)							
	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990
2000	11.49	11.40	9.69	8.16	9.96	10.23	9.84	9.39	10.9	10.85	9.01	7.05	9.36	9.58	9.40	8.93
2001	11.60	11.40	10.50	7.65	9.56	10.30	9.82	9.50	11.01	10.96	9.25	6.54	9.10	9.71	9.38	9.06
2002	11.55	11.51	9.66	7.56	9.90	10.18	9.83	9.45	11.03	11.09	8.38	7.08	9.62	9.62	9.47	8.98
2003	11.51	11.47	9.12	7.74	9.98	10.19	9.84	9.50	11.01	10.98	8.40	7.10	9.74	9.61	9.37	9.05
2004	11.60	11.30	9.72	9.02	10.44	10.12	10.13	9.47	11.06	10.92	8.60	8.00	10.07	9.58	9.73	8.95
2005	11.56	11.41	10.90	8.90	10.42	9.88	9.82	9.09	10.87	10.79	8.70	8.30	10.16	9.39	9.52	8.69
2006	11.34	11.18	10.03	8.05	10.46	9.82	9.68	8.98	10.61	10.51	8.61	7.46	10.00	9.25	9.28	8.61
2007	**11.35**	**11.12**	9.99	8.73	**11.11**	**9.91**	**9.46**	**8.89**	**10.49**	**10.40**	**8.47**	7.70	10.05	9.11	9.05	8.55
2008	11.35	11.39	10.03	9.08	10.20	10.00	9.68	9.08	10.65	10.74	8.17	7.79	10.20	9.40	9.13	8.76
2009	11.45	11.44	9.70	8.89	NO	10.00	10.10	10.30	10.66	10.72	8.43	7.88	NO	9.29	9.63	9.19
2010	11.10	11.25	9.44	8.87	NO	10.17	9.73	NO	10.30	10.5	8.56	8.02	NO	9.52	9.30	NO

Data from/Dane z CBI PZHiPTCh "POLSUS"

NO – not determined/nie oznaczono

Table 2a. Average results of reproduction performance evaluation of different breeds of sows in Wielkopolska region in the period from 1.01.2000–31.12.2010

Tabela 2a. Średnie wyniki oceny użytkowości rozpłodowej loch poszczególnych ras w Wielkopolsce w okresie od 1.01.2000 –31.12.2010

Year/Rok	Age at the first farrowing (days) Wiek pierwszego oproszenia (dni)								Farrowing interval (days) Okres międzymiotu (dni)							
	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990
2000	358	356	363	360	362	369	385	365	183	182	197	212	184	177	185	155
2001	357	341	372	485	318	352	370	353	182	180	183	287	200	176	189	155
2002	355	335	397	381	361	365	384	349	180	178	181	257	187	178	182	155
2003	357	345	390	359	370	365	370	359	186	188	184	206	181	188	202	164
2004	354	347	418	495	343	344	387	364	186	183	190	210	188	182	190	158
2005	359	345	394	443	366	379	378	375	177	176	187	196	169	174	179	160
2006	333	344	406	507	400	368	387	371	174	176	184	187	188	181	189	162
2007	353	348	433	534	313	358	400	367	173	173	190	201	184	181	187	163
2008	354	352	386	468	NO	369	400	384	172	173	193	209	185	189	184	162
2009	352	346	383	434	NO	378	372	393	169	169	191	211	NO	170	174	171
2010	359	348	356	419	NO	394	377	NO	168	169	193	196	NO	190	166	NO

Data from/Dane z CBI PZHiPTCh “POLSUS”

NO – not determined/nie oznaczono

Table 3. Average results of performance test of gilts from different breeds in Wielkopolskia region in the period from 1.01.2000–31.12.2010
Tabela 3. Średnie wyniki oceny przyżyciowej loszek poszczególnych ras na terenie Wielkopolski w okresie 1.01.2000–31.12.2010

Year/Rok	Average backfat thickness (mm) Średnia grubość słoniny (mm)								Standardised daily weight gain (g) Przyrost dzienny standaryzowany (g)							
	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990
2000	11.2	11.0	22.5	NO	10.5	10.9	9.6	10.2	576	588	624	NO	613	562	576	583
2001	11.0	10.7	18.2	NO	9.8	10.4	9.4	10.0	585	596	477	NO	591	575	570	582
2002	11.9	10.9	17.2	16.8	10.8	11.1	9.8	9.8	593	607	490	360	628	591	554	569
2003	10.5	10.6	17.1	19.0	12.1	10.5	9.5	10.2	606	618	425	350	617	651	557	584
2004	10.2	10.7	20.2	22.4	10.3	10.3	9.0	9.3	615	618	467	323	715	733	771	567
2005	10.6	10.9	20.4	18.7	10.4	10.5	9.9	9.8	625	632	448	361	580	617	609	575
2006	10.3	10.3	22.6	19.7	NO	10.1	9.8	9.3	622	638	488	385	NO	612	593	556
2007	10.2	10.3	20.8	22.7	12.2	10.4	9.7	9.7	620	623	461	369	676	635	626	569
2008	10.2	10.3	16.7	17.8	9.9	10.1	9.8	10.7	625	631	436	385	621	623	590	594
2009	10.2	10.4	17.9	21.6	NO	10.3	9.9	10.4	627	636	440	419	NO	621	588	593
2010	10.00	10.3	18.0	20.0	NO	10.7	10.1	NO	621	629	501	498	NO	647	609	NO

Data from/Dane z CBI PZHiPTCh "POLSUS"
NO – not determined/nie oznaczono

Table 3a. Average results of performance test of gilts from different breeds in Wielkopolskia region in the period from 1.01.2000–31.12.2010
Tabela 3a. Średnie wyniki oceny przyżyciowej loszek poszczególnych ras na terenie Wielkopolski w okresie 1.01.2000–31.12.2010

Year/Rok	Meat content in the carcass (%) Zawartość mięsa w tuszy (%)								Loin „eye" height (mm) Wysokość „oka" polędwicy (mm)							
	WBP	PBZ	ZŁB	ZŁP	HAM	DUR.	PIET.	Line 990	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990
2000	57.3	57.5	47.5	NO	58.5	57.2	60.6	58.6	49.0	49.0	49.0	NO	52.0	48.0	57.0	51.0
2001	57.7	57.9	50.9	NO	59.1	57.8	60.9	59.0	50.0	50.0	48.0	NO	52.0	48.0	58.0	52.0
2002	57.8	57.8	50.7	50.7	59.1	57.6	60.7	59.2	50.0	50.0	43.6	41.5	55.0	50.0	58.0	52.0
2003	58.6	58.5	50.4	48.6	57.6	58.6	61.3	59.1	52.0	52.0	41.7	40.9	54.0	52.0	59.0	54.0
2004	58.7	58.4	48.5	45.8	59.8	60.0	62.6	59.8	52.0	52.0	45.0	41.7	56.0	57.0	63.0	52.0
2005	57.6	57.4	48.0	48.6	57.7	58.0	61.9	59.7	55.0	55.0	44.0	39.9	53.3	54.9	58.8	55.0
2006	58.5	52.8	46.6	47.3	NO	58.7	62.6	60.0	56.0	56.0	45.9	38.3	NO	55.4	57.2	54.6
2007	58.7	58.5	48.1	45.1	59.6	59.1	62.4	59.5	56.0	56.0	45.5	40.1	69.0	56.4	58.6	56.1
2008	58.5	58.5	51.0	49.5	59.2	59.4	62.4	60.0	56.0	56.7	42.9	40.9	55.6	56.5	57.9	60.6
2009	58.9	58.8	50.3	46.7	NO	59.2	62.0	60.0	57.5	57.3	44.3	42.6	NO	56.3	60.0	60.0
2010	59.1	58.8	50.4	48.1	NO	58.2	61.4	NO	56	56	44.7	42.4	NO	56	59	NO

Data from/Dane z CBI PZHiPTCh "POLSUS"
NO – not determined/ nie oznaczono

Table 4. Average results of performance test of boars from different breeds in Wielkopolska region in the period from 1.01.2000–31.12.2010
Tabela 4. Średnie wyniki oceny przyżyciowej knurków poszczególnych ras na terenie Wielkopolski w okresie 1.01.2000–31.12.2010

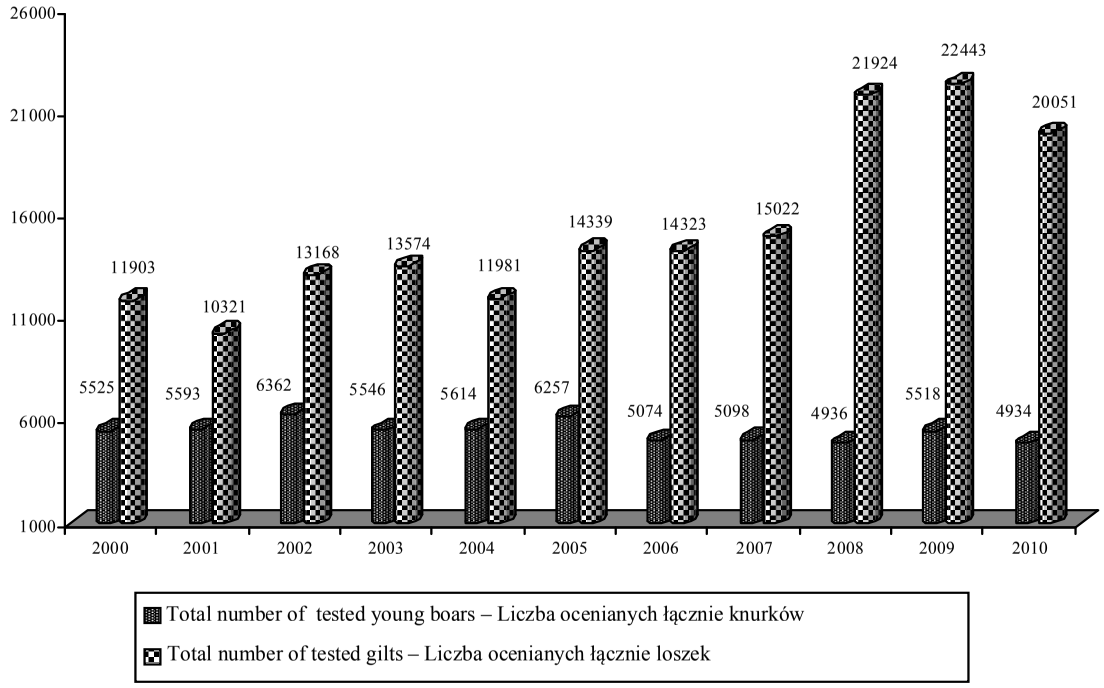
Year/Rok	Average backfat thickness (mm) Średnia grubość słoniny (mm)								Standardised daily weight gain (g) Przyrost dzienny standaryzowany (g)							
	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990
2000	11.1	10.8	NO	NO	10.4	10.6	8.9	10.0	628	638	NO	NO	628	601	601	637
2001	10.7	10.6	25.8	NO	9.6	10.3	8.7	9.6	635	642	484	NO	624	623	595	636
2002	10.5	10.6	18.3	NO	12.5	10.8	8.9	9.5	640	668	425	NO	688	624	623	615
2003	10.2	10.3	14.6	NO	9.9	10.5	8.7	10.1	661	670	433	NO	547	663	602	634
2004	10.0	10.2	14.3	21.5	8.8	9.8	8.5	8.8	658	686	449	476	761	780	781	622
2005	9.3	9.5	17.5	17.2	10.2	9.6	9.0	8.5	673	690	452	395	630	665	660	623
2006	9.0	9.2	18.0	19.8	NO	9.2	8.9	8.1	666	691	394	439	NO	658	636	601
2007	8.8	9.3	15.3	17	NO	9.5	8.7	8.8	672	677	445	312	NO	667	629	642
2008	9.2	9.3	16.1	16.2	NO	9.4	8.7	9.8	679	675	416	393	NO	663	619	674
2009	9.1	9.5	18.3	23.9	NO	9.7	8.6	9.6	691	674	482	433	NO	670	659	674
2010	8.9	9.4	13.9	21.3	NO	9.5	9.0	NO	681	671	474	448	NO	673	668	NO

Data from/Dane z CBI PZHiPTCh “POLSUS”
NO – not determined/nie oznaczono

Table 4a. Average results of performance test of boars from different breeds in Wielkopolska region in the period from 1.01.2000–31.12.2010
Tabela 4a. Średnie wyniki oceny przyżyciowej knurków poszczególnych ras na terenie Wielkopolski w okresie 1.01.2000–31.12.2010

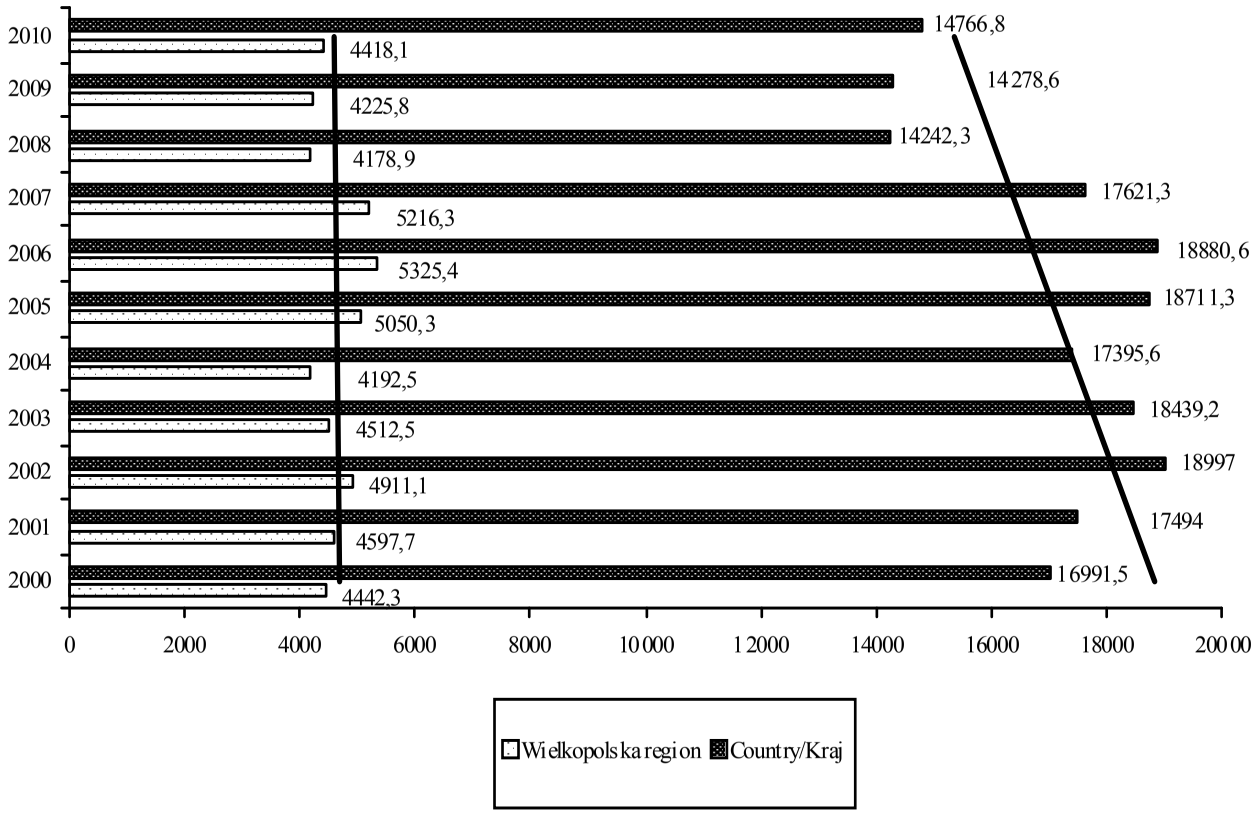
Rok/Year	% meat content in the carcass % zawartość mięsa w tuszy								Loin „eye" height (mm) Wysokość „oka" polędwicy (mm)							
	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990	WBP	PBZ	ZŁB	ZŁP	HAM.	DUR.	PIET.	Line 990
2000	58.3	58.8	NO	NO	59.7	57.4	61.5	58.7	53.0	54.0	NO	NO	56.0	47.0	58.0	51.0
2001	58.9	59.1	45.4	NO	59.9	58.3	61.7	59.3	54.0	55.0	52.0	NO	54.0	50.0	59.0	52.0
2002	59.3	59.5	49.3	NO	58.8	58.5	61.9	59.4	55.0	56.0	41.5	NO	60.0	52.0	60.0	52.0
2003	59.9	59.8	52.7	NO	59.7	59.1	61.9	59.3	56.0	56.0	41.0	NO	54.0	54.0	59.0	54.0
2004	59.4	60.1	54.1	45.2	60.8	60.7	63.2	60.2	56.0	57.0	42.0	36.0	55.0	58.0	64.0	52.0
2005	60.1	59.5	50.7	50.2	56.8	59.1	62.1	60.1	56.0	57.0	40.0	41.6	52.0	55.5	61.0	55.0
2006	60.5	60.1	50.8	47.8	NO	60.3	62.6	60.4	56.0	57.0	38.0	40.8	NO	58.0	59.0	55.0
2007	60.2	60.1	54.6	50.3	NO	60.0	63.3	60.3	56.0	57.0	40.0	41.0	NO	58.0	59.0	56.0
2008	60.2	60.5	51.9	51.3	NO	60.6	63.4	60.1	56.8	57.4	44.2	42.2	NO	57.9	59.7	58.2
2009	60.4	60.4	49.9	43.8	NO	60.3	62.2	60.1	57.7	57.8	43.9	39.1	NO	58.8	62.4	58.0
2010	60.3	60.5	53.2	47.6	NO	60.5	61.7	NO	56.0	57.0	41.7	45.1	NO	59.0	62.0	NO

Data from/Dane z CBI PZHiPTCh "POLSUS"
NO – not determined/nie oznaczono



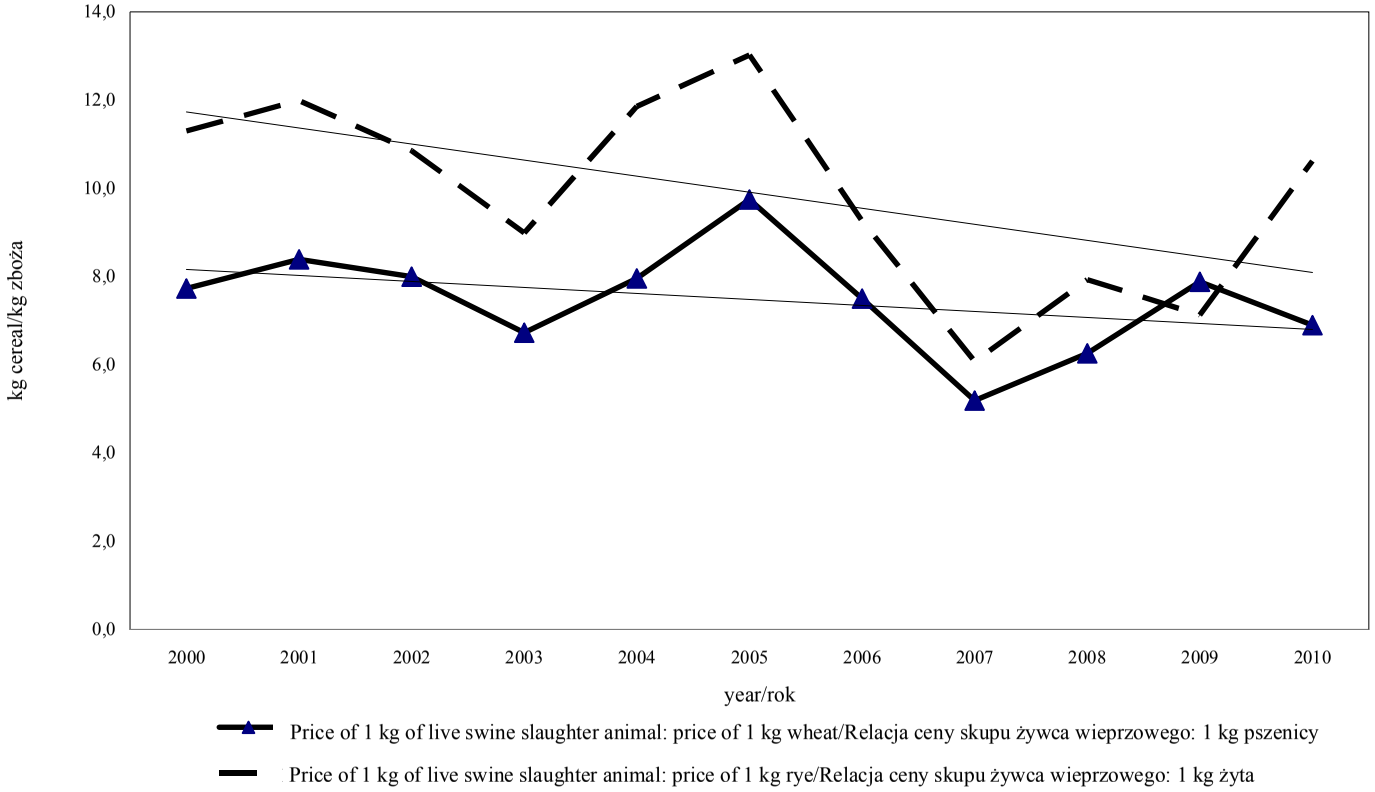
Data from/Dane z CBI PZHiPTCh "POLSUS"

Graph 3. Number of tested young boars and gilts in Wielkopolska region in the period from 1.01.2000 to 31.12.2010
Wykres 3. Liczba ocenianych młodych knurów i loszek w Wielkopolsce w okresie od 1.01.2000 do 31.12.2010

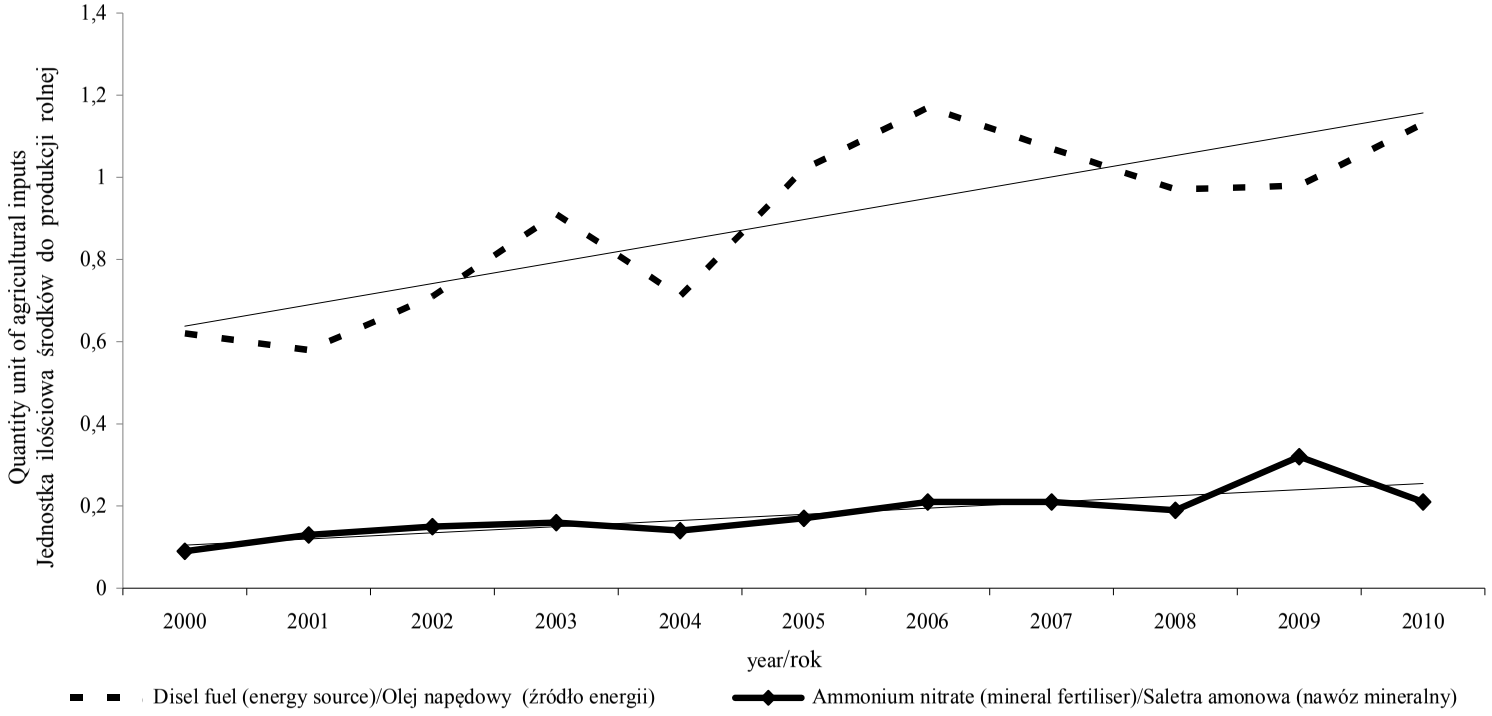


Data from/Dane z CBI PZHiPTCh "POLSUS"

Graph 4. Pig population in years 2000–2010
Wykres 4. Pogłowie trzody chlewnej w latach 2000–2010



Graph 5. Relationship of the purchase price of swine slaughter animals to the price of wheat and rye
Wykres 5. Relacja ceny skupu żywca wieprzowego do ceny pszenicy i żyta



Graph 6. Price relationship of selected agricultural inputs to pork purchase prices
Wykres. 6. Relacja cen wybranych środków do produkcji rolnej do cen skupu żywca wieprzowego

On April, the 1st, 1995, a new methodology of live-animal assessment was introduced which allows determination of swine breeding value regarding their fattening and slaughter performance [Różycki 2003, 2004]. It takes into consideration two major traits: daily body weight gains and meat percentage content in carcasses. Partial changes were introduced to the above-mentioned methodology of live-animal evaluation as of October, the 1st, 2004. Similarly to the earlier evaluation methodology, also in the modified one the two main parameters were taken into consideration. However, in order to increase the accuracy, meat content standardised percentage at 180 days of life was introduced, whereas for the Pietrain breed – a novel formula for meat percentage content was developed. In addition, changes were also made with respect to the introduction of separate formulas which make it possible to calculate live-animal evaluation for gilts and young boars of female lines and gilts and young boars of male lines.

It is evident from data collated in Graph 3 that the total number of young boars and gilts evaluated in Wielkopolska voivodeship was the highest in comparison with the entire country in all analysed eleven years. In the year 2000, the number of assessed young boars reached approximately 25% of the total number of young boars evaluated in the entire country, while from among 53496 gilts evaluated in Poland, approximately 22% was assessed in Wielkopolska Voivodeship. In years 2001 and 2004, a distinct drop in numbers of evaluated sows was observed as the animals were used as herd replacements for mass populations. From 2005 onwards, a steady increase in numbers of evaluated gilts was registered. Tables 3, 3a, 4 and 4a collate mean evaluation results of live gilts and young boars of individual breeds in Wielkopolska Voivodeship.

As evident from the data of the Central Statistical Office, Department of Agriculture and Food Economy, in years 2000–2010 the swine population in Wielkopolska Voivodeship was the highest in Poland. The population of these farm animals exceeded 26% of the entire swine population in Poland in years 2000–2002 (Graph 4).

In spite of dropping swine populations in years 2003–2004, the highest numbers of pigs continued to remain in this region of Poland and constituted approximately 24% of the total country swine population. In years 2005–2010, the swine stock in Wielkopolska Voivodeship greatly exceeded populations of these farm animals in other voivodeships reaching 27% in 2005, 28% – in 2006, and in years 2007-2010 – respectively from 29% to 29.91% of the total swine population in Poland.

Growing European competition as well as world swine producers, unfavourable conditions, especially with respect to relationships of swine purchase prices to the prices of cereals and agricultural inputs, all contributed to huge problems and crisis in swine breeding both in Wielkopolska Voivodeship as well as in the remaining parts of Poland (Graphs 5 and 6).

DISCUSSION

Variations in swine populations lead, in the wake of appropriate time delays, to fluctuations in the production and supply of pork. On the basis of performed analyses, Głowacka and Eckert [2003] maintain that rapid changes in pork price levels found their automatic reflection in production levels of live slaughter animals and, consequently, in population levels. This situation was strongly influenced by disadvantageous relation-

ships between agricultural production inputs and feed costs, on the one hand, and prices offered for live slaughter animals. The analysis of our own investigation results exhibited an identical tendency. High prices of swine live slaughter animals accompanied by lower cereal prices increased profitability of swine rearing and breeding which led to increased swine population. According to Wielgolewska [2005], among factors frequently stimulating the intensification or causing changes in pig populations is the instability of swine rearing profitability. That is why both in Wielkopolska Voivodeship as well as in the entire area of Poland, variations in swine populations and purchase prices were quite noticeable which were preconditioned by the so-called "pig cycles". Also Stańko and Seremak-Bulge [2000] arrived at similar conclusions.

A very important aspect of domestic pig production is mass rearing of these animals in small farms. In such situations, farmers do not have a direct contact with meat processing plants. It is a group of specialised go-betweens who do the job [Eckert 2005].

According to Orzechowska and Mucha [2004, 2009], breeding-production programs in Poland appear to go in the direction of utilising domestic WBP and PBZ breeds as well as meat breeds for the production of slaughter material. This is caused by the requirement to produce pork meat containing the lowest quantities of fat in favour of lean meat. The results regarding fattening and slaughter traits recorded for the entire country as well as in individual regions of Poland vary and change in the course of time and, therefore, they should be monitored [Buczyński *et al*., 2001, Michalska *et al*., 2004, 2006, Milewska and Falkowski 2001, Różycki 2003, 2004].

Swine breeders and producers had hoped that the expansion of the European Union by 10 new member states would result in higher prices of slaughter live animals and expansion of swine production. This, however, did not happen and the domestic pork market remained in crisis. Additionally, the lack of stability of the farming sector of swine rearing and breeding is further confirmed by territorial differences. The presented research results indicated unequivocally how Wielkopolska Voivodeship stood out in comparison with the rest of the country. The unique position of this region of Poland can be attributed to the extent of industrialisation and breeding traditions. Investigations conducted by Grodzki [2005] corroborated that leading pig farms with respect to stocking rate can be found in such regions as Wielkopolska, Kujawy and Central Pomerania. These areas are characterised by higher than average farming culture and long traditions in animal rearing.

CONCLUSIONS

1. In years 2000–2010, average number of sows in herds in Wielkopolska Voivodeship increased steadily and ranged from 25–50 heads. In comparison with the remaining regions of the country, this voivodeship was also characterised by the highest number of evaluated sows.

2. Wielkopolska Voivodeship was found to have the highest swine population in Poland which, during the analysed period of time, constituted over 27% of the total number of pigs in our country.

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Streszczenie. Poprzez analizę danych wykazano zmianę w strukturze hodowli i stanu pogłowia trzody chlewnej na terenie woj. wielkopolskiego. Bezpośredni wpływ na taką sytuację miały cykliczne wahania relacji kosztów paszy i środków do produkcji rolniczej w stosunku do cen oferowanych za żywiec wieprzowy. Nadmiar podaży tuczników skutkował drastycznym obniżeniem cen skupu, a przy zmniejszeniu podaży rosły ceny skupu. Dlatego też zauważalna była w Wielkopolsce, jak również na terenie całej Polski, charakterystyczna niestabilność stanu pogłowia i cen skupu, która warunkuje tzw. cykle świńskie. W latach 2000–2010 w woj. wielkopolskim sukcesywnie wzrastała średnia liczba loch w stadach, która mieściła się w przedziale 25–50 szt. Mimo niekorzystnej sytuacji w sektorze trzody chlewnej Wielkopolska w tym okresie cechowała się największą na terenie kraju populacją świń, stanowiącą średnio ponad 27% ogólnego stanu pogłowia w Polsce.

Słowa kluczowe: chów, hodowla, trzoda chlewna, Wielkopolska