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THE ANALYSIS OF MILK PRODUCTION DEVELOPMENT CONDITIONINGS IN POLAND

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ABSTRACT. Subject of this paper are deliberations connected with production and market of milk. There are defined trends in development of milk production on the basis of research and literature survey. Important issues of conditions of milk cattle keeping are raised. Attention is paid to significant extent of investments related to modernisation of these conditions.

Key words: agriculture, milk production, well-being of animals, investments connected with milk production, milk market, cow housing systems

Introduction

Polish agriculture is forced to more advanced process of restructuring and modernisation in terms of integration with the European Union. Dairy industry is one of the branches facing the most difficult challenges and it could be one of the most profitable in terms of European competition. It is connected with producing milk as well as its processing. There have appeared some dynamic processes of adjusting Polish milk producers and processing plants to European and international standards. Milk producers, despite problems with capital, undertake investments, which make possible reduction of technical, technological and genetic backlog. These actions head for getting competitive products on European market and reaching sanitary, veterinary and quality standards in milk production at the same time.

These changes mean requirements for milk farms for further production concentration and specialisation, cost rationalisation, as well as applying raising systems which guarantee the best quality products and further investments.

The aim of the paper is the analysis of factors which would determine milk production development in our country within the next few years. In the article there will be generally presented main effects referring to milk cattle raising, situation on milk market and expected directions of milk production development with special attention to trends and changes in cow housing system.

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Cattle stock and milk production

Introduction of milk contingents in Poland determines occurring of analogical effects as in Western Europe – radically decreasing number of milk deliverers (e.g. in France before introduction 400 thou. and now 125 thou.) with increasing milk yield and amount of delivery to dairy (in France from about 60 thou. l to 140 thou. l).

In 2004 in Poland once again there was recorded decrease of cattle stock like in the other countries of EU-25 (with exception of Lithuania). The tendency has maintained for few years and the decline amounted to about 3% last year (**Cukierski** and **Kupczyk** 2005). A number of farms making a living by milk production will diminish considerably, too. Farmers who cannot meet veterinary standards till 2006, will give up milk cattle raising. At the same time, the average of stock size will be increasing due to development of specialised farms which receive additional milk quotas of national reserve on the basis of sold milk quantity in the period 1st April 2002 from 31st March 2005 (Fig. 1).

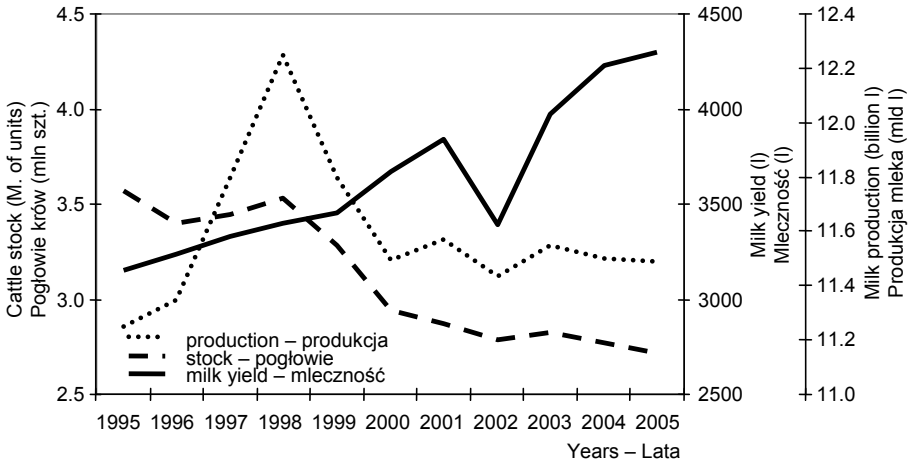

Fig. 1. Cattle stock, milk yield and milk production in Poland per year (**Szajner** 2004)
Ryc. 1. Pogłowie krów, mleczność oraz produkcja mleka w Polsce rocznie (**Szajner** 2004)

Milk production within the next period of time will keep at the level 11.5 billion litres and the decline of cattle stock will be compensated by further increase of milk yield. In the middle of the 2005 year a number of cows amounted to 2.7 M. of units with average milk yield of 4200 l. Modernisation and production specialisation will be conductive to systematic improvement of milk quality. In the second half of the year 2004, according to Integrated System of Agricultural Market Information data, milk of extra class amounted to 83% in purchasing.

Most probably concentration process of land, animals and production will escalate as it was in the last 30 years in EU (e.g. average size of cattle stock in The Netherlands amounted to 16 units and in Federal Republic of Germany – to 8 units; in 1997 accordingly 44 and 28 units). These tendencies will be conducted by programmes supporting Polish agriculture restructuring, which were put in motion in 2004, like Sectoral Operational Programme (SOP) and Rural Development Plan for Poland (PROW). Anticipated

labour costs increase and occurring disproportion between the cost and milk price (costs of labour in Germany in the last 50 years have increased 18 times while the price only three times) will leave their trace on Polish dairy industry within the next years.

Milk market

Since the end of 2003 there has been significant a growth of milk prices and this tendency has intensified after the 1st May 2004, i.e. since national dairy industry became a part of Unified European Market subordinating to rules of Common Agricultural Policy (**Seremak-Bulge** 2004). First time, for many years, price drop did not appeare in summer season of 2004 (Fig. 2). Prices of milk in purchasing went up by about 30% last year, thanks to it at the end of the year 2004 average purchasing price in Poland (25 Euro per 100 kg) came level with the price in Belgium and it approached to prices in the United Kingdom and France (Fig. 3). The reason of this situation was developing demand for raw milk connected with increasing export of milk products (especially skimmed milk and butter). First analyses carried out in 2005 point inhibition and even reversal favourable circumstances. At the beginning of this year occurred an expected production and milk supply growth (calving period). It was higher than in the same time of previous year by about 10%. It caused in February of the current year first drop in milk purchasing prices since July 2003. Butter production as well as skimmed powdered milk production in the first quarter of the year 2005 were more or less the same as in the previous year. Disturbing effect is the fact of occurring of downward trend in butter and skimmed powdered milk selling prices connected with drop in prices of milk products on internal markets of EU (**Rynek...** 2005).

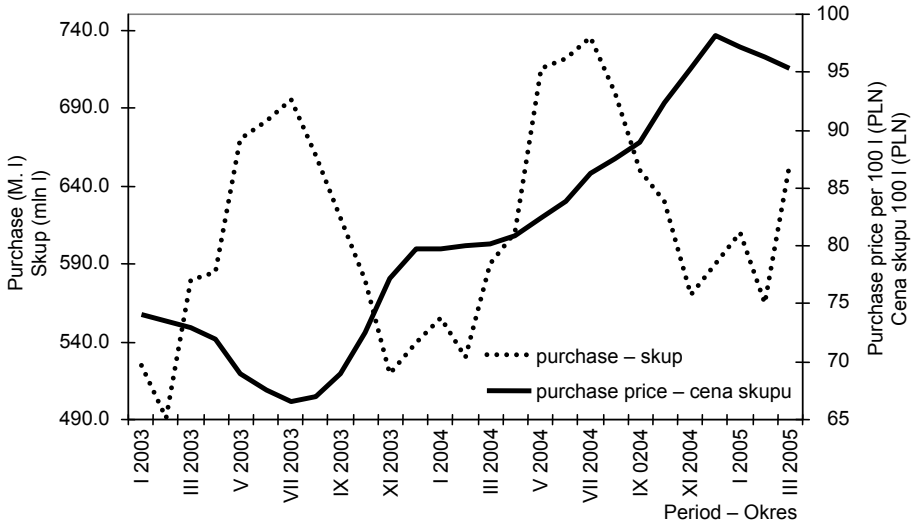

Fig. 2. Purchase and milk purchase prices in Poland (own calculations and data from Central Statistical Office)

Ryc. 2. Skup i ceny skupu mleka w Polsce (obliczenia własne i dane GUS)

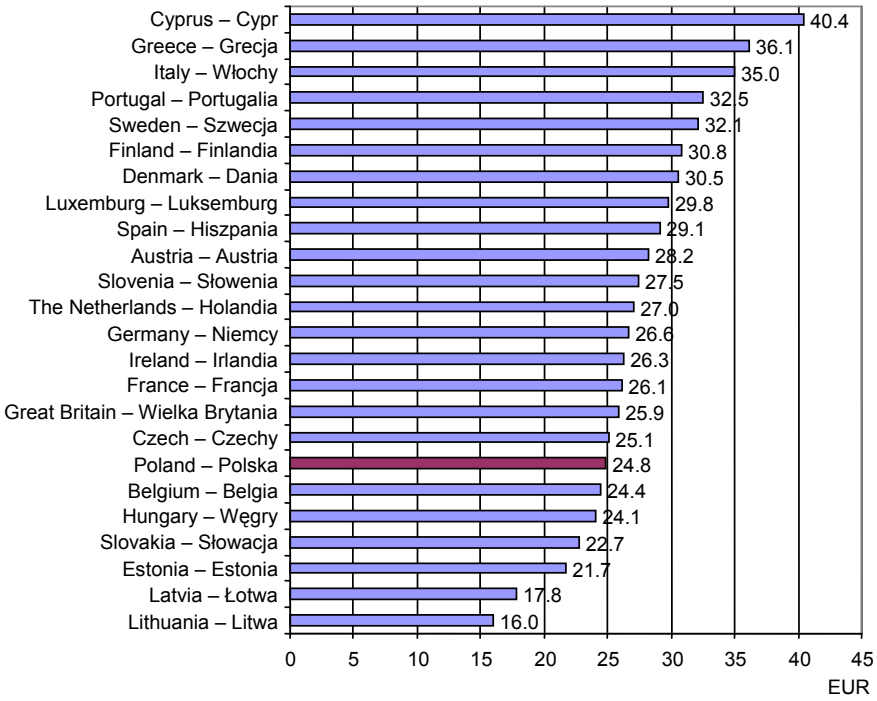

Fig. 3. Milk purchase price per 100 kg in EU on October 2004
(**Internetowa Giełda Rolnicza** 2005)
Ryc. 3. Cena skupu 100 kg mleka w UE w październiku 2004 roku
(**Internetowa Giełda Rolnicza** 2005)

Prospects of milk production development

Necessity of meeting the mentioned above standards and matching competitors from the European Union makes modernisation of buildings for livestock and milking apparatus more important in milk production. At the same time, on the basis of West European countries experience, issues of animals' well-being, good farming practice rules and sustainable development of agriculture will become more important in milk production within the next few years. According to these conceptions reaching satisfactory outcomes of raising is possible providing securing optimal environmental conditions for cattle. Cattle in our country are raised in non grazing system, and stall-pasture system to a lesser extent. In practice it means that within all the year or autumn-winter season and in early spring animals are in buildings for livestock. Further development of cattle's raising in Poland, in the mention above context, should be based on two clue assumptions: maximum using pastures and securing the best life and production conditions in building for livestock.

Research proves that using pasture is very important for cattle. It influences favourably animal organism stimulating it to better metabolism, improving disease and

environmental resistance. Pasture causes better young animals' development, increases reproduction ability and cattle yield, and extends utilisation period as well as improves milk quality. In pasture raising there is periodically lower labour consumption of service and there are lower costs of animals' raising, too. Yearlong cattle's keeping in non grazing system has been till now characteristic of large herds where cattle yards were used only partly. In private farms, where cattle stock numbers from few to dozen or so heads, more often was applied stall-pasture system. The situation changes – more frequently cattle are raised in free stall system (mentioned below), with possibility of using extra area that is given by cattle-runs. This system is applied in large cattle herds (companies of Agricultural Property Agency) and it is a real chance to become common system in our country.

As far as buildings are concerned, solutions of spatial-functional system as well as technical parameters are determined by environmental needs of different groups of cattle (**Marciniak** et **al.** 2001). Barns could be divided into following types: universal for cows, heifers and calves, barns only for cows and special buildings for calves and young cattle. Buildings with separated parts for animals groups allow applying different technological systems of animals management and maintaining the best environmental and economic parameters for these groups. It is possible only in farms with large herds. As regards technological-building systems there are many technical solutions (survey about a variety of milk cattle management systems is presented in Table 1).

Generally speaking, depending on cow housing system, dairy barns can be with tie or free stalls. Tying barns are preferred in farms with small herds (few – a dozen or so units); in farms with bigger herds (so the most predisposed to face European competition) free stalls guarantee animals' well-being which makes possible gaining high level of productivity as well as high milk quality. Moreover, labour input is twice lower in free stalls system than in tying ones (higher labour consumption in milking, feeding and manure removing). In passing, power of this trend should be stressed – in countries which first have given up tying system nowadays even 90% cattle stock is raised in free stall barns (The Netherlands). As novelty, it should be reported raising interest in open and half-open barns (without partly or completely outside wall) which have not been so widespread in our conditions. According to research on elimination of draughts, low temperatures are not problems and livestock buildings are in better microclimatic conditions (lack of moisture, lower concentration of ammonia, lower amount of microorganisms etc.) than conditions in traditional cow houses (**Kovolelis** et **al.** 2000).

Domestic examples of large herds belonging, among others, to the so called strategic companies group of Agricultural Property Agency, indicate unambiguously that apart from improvement in organisation and management, high level of genetic potential and high quality fodder, milk production and quality development is possible, first of all, thanks to improving living and producing conditions. It is not by accident that companies which invested in modern free stall barns with milking center have reached the highest milk yield within the last years (Kamieniec Ząbkowicki, Golejewko, Osięciny, Szelejewo).

Introducing changes in cattle raising, so substitution of tying system for free stall system makes possible applying many favourable changes and reaching better results of milk production. The most important of them are:

– substitution of feeding system with one ration to all cows for system with division to technological groups of animals depending on psychological state and milk yield, with possibility of using pasture,

Table 1

Survey of cattle management systems (Głowacka 2004)
Przegląd systemów utrzymania bydła (Głowacka 2004)

Restricted movement system System z ograniczeniem swobody ruchu	Tying system System uwięziowy	Bedding system System ściółkowy Non bedding system System bezściółkowy	
	Combiboxes system (closed combiboxes) System kombiboksowy (kombiboksy zamknięte)	Bedding system System ściółkowy Non bedding system System bezściółkowy	
Free stall system System wolnostanowiskowy	Closed barns (traditional) Obory zamknięte	Box system Boksowy	Bedding system System ściółkowy Non bedding system System bezściółkowy
		Combibox system (open combiboxes) System kombiboksowy (kombiboksy otwarte)	Bedding system System ściółkowy Non bedding system System bezściółkowy
		Group boxes system Kojce grupowe	Bedding system System ściółkowy Non bedding system System bezściółkowy
	Open barns Obory otwarte	Group boxes system Kojce grupowe	Bedding system (mainly deep bedding) System ściółkowy (głównie na głębokiej ściółce)

– increase of milk yield per cow,
– improvement in health state of animals (prolonging period of cows' use),
– lowering service labour consumption (especially milking),
– lowering employment,
– possibility of introducing herd management computer system which records basic parameters such as: yield, feed intake or cows' activity (quick and efficient determining rutting period results increase of insemination efficiency follows higher milk yield and fodder utilisation),
– carrying out accurate cost accounting of feeding and level of milk production profitability on the basis of complete analysis of all factors influencing milk yield,
– higher milk production profitability.

Scandinavian countries, The Netherlands and Germany are leaders in modernising and innovating livestock buildings and associated infrastructure. Poland is at the beginning of a broad programme of modernisation of these buildings. The process has escalated while funds designed to this purpose (SAPARD, SOP) have been put into motion.

It consists of big agricultural enterprises, especially private and owned by the Treasury. Observations of economic life indicate that a range of investing broadens, the number of investors rises as the well as total value of the invested capital. It also includes average farms concentrating land to enlarge their herds and undertaking investments. Farmers are aware that cow houses for larger herds, over 30 units, should guarantee free stalls, good microclimate, easy animals' service and milking. Essential aspects are low costs of conversion and keeping cow houses. Despite the progress in farms equipment with mechanisation assets (mechanical milkers in milking centres and milk container refrigerators) simple milkers dominate in small farms and two-third of farms still milk by hand (**Trzmiel** and **Kupczyk** 2005).

Conclusion

Important changes have taken place in milk production in Poland in recent years. A number of farms with cows has dropped from 1.3 M. in 1996 to less than 700 thous. last year, but only 50% of farms (about 355 thous.) sells milk to milk plants – 80% of milk comes form 130 thous. farms possessing 5 and more cows. It is predicted that the number of farms with cows will decrease to 170 thous. and cattle stock from 2.8 M. to 2.0 M. heads till 2015. According to Institute of Agriculture and Food Economics, milk production is forecast to decrease too (to about 11.2 M. t). Average milk yield will rise from 4232 l in 2004 to 5600 in 2015 as well as milk purchase from 7.9 M. t to 8.9 M. t. Milk and milk products demand is going to increase faster than milk purchase. It is estimated that Poland (which now has positive balance of milk articles trade – about 300 M. USD) will become an importer of milk after 2010. Milk consumption in Poland would exceed its production by 1.5 M. t. We would have to import this amount of milk from countries which produce at higher prices. This is a result of production quoting and ceasing taking into consideration market conditions (**Internetowa Giełda Rolnicza** 2005).

In Poland, milk production is the lion's share of agriculture commercial production and dairy industry (production and processing) employs about 25% of labour force in agricultural sector and creates 17% of food industry production. Poland with production of 11.5 M. t and The Netherlands are in the fourth position in the European Union and in the sixth position (with Russia) in Europe. Our share in milk production is about 8.5%, share in cattle stock is about 12% (**Internetowa Giełda Rolnicza** 2005). Profitability of milk production in Poland rises quickly. Polish farmers receive price for milk comparable to some countries of EU-15. As the result, low prices of milk are no longer trump card of Polish dairy industry and it has to compete for EU's market by quality.

Cows' rearing is an important source of constant income and food for all the family. Research and economic analyses indicate that milk farms have the best liquidity. Several thousand farms live by cattle raising and milk sale. Milk is still the main source of protein in people's food. Butter and dairy products expenditures share 15% of value household's portfolios. It follows that milk production is one of more important Polish agricultural branches with great economic and social importance. It arouses farmers, producers as well as consumers' interest. Therefore, privatisation process of milk production should be permanently analysed for effective evaluation. Defining directions of

development and perspectives for domestic producers should take into consideration wide range of factors implicating them. The most important conditionings such as trends in producing and processing milk, occurrences on milk market or new technological-building systems are presented in the paper.

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ANALIZA UWARUNKOWAŃ ROZWOJU PRODUKCJI MLEKA W POLSCE

S t r e s z c z e n i e

W pracy podjęto próbę analizy uwarunkowań rozwoju produkcji mleka w Polsce. Uwzględniono trzy główne grupy czynników, które implikują ewolucję: trendy w wytwarzaniu i przetwarzaniu mleka, zjawiska zachodzące na rynku mleka oraz nowe systemy technologiczno-budowlane obór dla bydła mlecznego. Z przeprowadzonych rozważań wynika, że w najbliższych latach będzie występować proces dalszej koncentracji i specjalizacji produkcji (spadek pogłowia krów i liczby producentów mleka, wzrost mleczności krów). Zjawiskiem oczekiwanym będzie wzrost konkurencji międzynarodowej, co skutkować będzie dążeniem do utrzymania opłacalności produkcji (racjonalizacja kosztów) i wdrażaniem systemów chowu i utrzymania krów gwarantujących najwyższą jakość otrzymywanego produktu oraz dbających o tzw. dobrostan zwierząt.