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DEVELOPMENT STRATEGIES OF POLISH DAIRY FARMS

STRATEGIE ROZWOJU POLSKICH GOSPODARSTW MLECZNYCH

Key words: dairy farms, competitiveness, revenues of farming

Słowa kluczowe: gospodarstwa mleczne, konkurencyjność

Abstract. The article presents development strategies for farms oriented towards raising dairy cattle selling annually 70,000 l of milk from the farm. It is the level of production approximate to the average level in Poland. Initially four directions of the farm development have been assumed: increasing the volume of milk production to 240 000 kg/y, raising cattle for meat, vegetal production and giving up agricultural production. It can be concluded from the analysis conducted that the total income of an agricultural family (after total changeover) is highest in the situation of increasing the milk production. Considering the natural and economic risk as well as the big demand for capital giving up agricultural production proves to be the best solution.

Introduction

What strategy to indicate for Polish farms dealing with milk production? It is the question to which no unequivocal reply can be given. It does not mean, however, that such questions should not be asked and should not be attempted to reply to. The difficulty within giving a reply to such question results from the complexity of conditionings where dairy farms operate and will operate. It is particularly hard to build a development strategy without the knowledge of external conditionings. They are especially hard to predict in the agricultural sector. It results inter alia from the specificity of agricultural production that is shaped by such factors as: 1) natural conditions, 2) food as the primary social good (policy towards the agricultural sector), 3) pursuing agricultural activity is based on live organisms that influence the natural environment. Additionally, the specific features of the agricultural production are influenced by changes within non-agricultural sectors. Also the big diversity of Polish dairy farms should be borne in mind. There are farms that have taken investment actions and are presently in relatively good economic condition, there is also a number of farms that face serious decision concerning either development or giving-up of milk production. Bearing in mind the above mentioned features it seems that when considering the directions of changes within the Polish dairy sector particular attention should be paid to: 1) the competitiveness of Polish dairy farms and dairy plants against significant states in the production and processing of milk, 2) analysis of suggested solution within EU agricultural policy, 3) consider whether farms will be interested in the development of milk production (economic stimuli). It should be noticed that the author has attempted to present political and macro-economic conditionings influencing the stagnation or development of dairy farms in Poland in a few articles published inter alia in scientific magazines the “SERiA” [Parzonko 2007, 2008, 2009].

The objective of this article is to present the economic effects of the development strategy for the average (typical) dairy farm in Poland. Four strategies of developments have been analyzed: 1) the strategy assuming the increase in the volume of milk production from the farm, 2) the strategy assuming the profile changeover into raising cattle for meat, 3) the strategy assuming the farm orientation into vegetal production, 4) the strategy assuming giving up on agricultural production (farming out, selling fixed assets, working out of the farm). The problem presented will be analyzed with reference to the average farm dealing with raising milk cattle distinguished on the basis of FADN data [Goraj 2010] and own experience. The analysis of activity competitiveness will be conducted on the basis of total income of the agricultural family, reference of income to the employment of equity (return on equity) and work (work profitability).

Numerical data used for the analysis conducted comes from data of GUS (Central Statistical Office), IERiGŻ (Institute of Agricultural and Food Economics), ARR (Agricultural Market Agency) and own empirical research conducted within the framework of the Ministry of Science and Higher Education called “Economic and social conditionings of regional changes within production and processing of milk” no. 0890/B/H03/2010/39.

Table 1. Changes within quoting of milk production in years 2004-2009
Tabela 1. Zmiany w kwotowaniu produkcji mleka w latach 2004-2009

Province/Województwo	Quota year 2004/2005/Kwota mleczna 2004/2005			Quota year 2008/2009/Kwota mleczna 2008/2009		
	purchase of milk [kg]/ skupione mleko [kg]	number of wholesale suppliers/ liczba dostawców hurtowych	average purchase of milk from a supplier in the year [kg]/ średnie zakupy od dostawcy w roku [kg]	purchase of milk [kg]/ skupione mleko [kg]	number of wholesale suppliers/ liczba dostawców hurtowych	average purchase of milk from a supplier in the year [kg]/ średnie zakupy od dostawcy w roku [kg]
Podlasie/Podlaskie	1 787 384 166	43 805	40 803	2 421 185 470	34 301	70 586
Masovia/Mazowieckie	1 780 313 006	66 405	26 810	1 777 668 632	34 680	51 259
Wielkopolska/ Wielkopolskie	1 110 533 347	18 795	59 087	1 135 933 700	13 055	87 011
Łódź/Łódzkie	830 507 654	44 158	18 808	928 469 856	27 122	34 233
Lublin/Lubuskie	645 595 053	46 905	13 764	650 182 424	24 703	26 320
Kujawy and Pomerania/ Kujawsko-pomorskie	450 994 071	13 852	32 558	531 381 863	8 369	63 494
Warmia and Masuria/ Warmińsko-mazurskie	372 769 406	9 083	41 040	356 891 741	4 929	72 407
Świętokrzyskie/ Świętokrzyskie	231 198 624	21 690	10 659	232 573 319	11 115	20 924
Pomerania/Pomorskie	206 748 726	3 658	56 520	193 944 088	2 235	86 776
Silesia/Śląskie	189 638 048	12 305	15 411	163 335 544	5 527	29 552
Opole/Opolskie	185 560 712	3 664	50 644	307 512 017	2 657	115 737
Małopolska/ Małopolskie	165 360 558	16 602	9 960	189 384 474	8 467	22 367
Podkarpacie/ Podkarpackie	127 940 960	17 008	7 522	118 314 639	7 126	16 603
West Pomeranian/ Zachodniopomorskie	125 318 434	1 223	102 468	137 750 214	805	171 118
Lower Silesia/ Dolnośląskie	85 922 241	3 776	22 755	86 373 474	1 190	72 583
Lublin/Lubelskie	41 810 383	735	56 885	85 451 035	539	158 536
Total/Ogółem	8 337 595 389	323 664	X	9 316 352 490	186 820	X

Source: own study based on The Agricultural Market Agency
 Źródło: opracowanie własne na podstawie danych Agencji Rynku Rolnego

Characteristics of dairy farms in Poland and the analyzed farm

It can be concluded from the data of ARR [Agricultural Market Agency] that the number of farms having a wholesale milk quota in Poland decreases gradually. In the quota year 2004/2005 the number of farmers producing milk for sale amounted to 323,664, whereas in the quota year 2008/2009 it was only 186,820 (42% decrease). The global production of milk (including commercial farming) within the analyzed period increased and thus the average milk quota per one supplier increased from 35,356 kg to 68,719 kg [Kasztelan 2009]. These changes are of varied strength in particular provinces in Poland. Generally, it can be said that the milk production in Poland concentrates in the central and northeast parts of the country. Over 74% commercial milk was supplied in the quota year 2008/2009 from five provinces of: Podlasie, Wielkopolska, Masovia, Łódź, Lublin. It can be noticed that the concentration process of milk production in these provinces (apart from the Masovia Province) has increased successively (Tab. 1). A particularly significant increase took place in the Podlasie Province where the purchase of milk increased from 1,787,384,166 kg in the quota year 2004/2005 to 2,421,185,740 kg in the quota year 2008/2009 (by 35%).

The subject of the model analysis is the farm whose production potential is similar to the potential of an average farm established within FADN system (2009) with the production type: "milk cows". The production potential of the model farm has been slightly changed in relation to the farm established within FADN system (Tab. 2). The change was to make such farm similar to the average farm engaged in commercial milk production in the quota year 2009/2010.

In the farm used for the analysis there are buildings erected in the 70's and 80's and are in quite good technical condition. The building whose importance considering technologies of feed preparation is relatively small is a barn. This building may be much more effectively used (after specific modernization). The land resources are characterized with the average quality and relatively small number of fields located nearby the farm buildings. The farmer of the modelled farm has necessary equipment to pursue agricultural activity. The farm is equipped with two tractors from the 80's whose technical condition is defined as good, however they are sure to be worn economically and their replacement should be considered intensively. Other technical means (machines, tools, devices) are characterized with economic and technical wear. Their average life amounts to 18 years. A significant part of these means is obsolete in case of the farm's deep specialization in milk production. The modelled farm is run by an agricultural family.

Table 2. Primary parameters characteristic to the average farm established within FADN system type: "milk cows" and the farm analyzed

Tabela 2. Podstawowe parametry charakteryzujące przeciętne gospodarstwo wyodrębnione w systemie FADN w typie „krowy mleczne” oraz gospodarstwo poddane analizie

Specification/ Wyszczególnienie	Unit/ Jedn. miary	The farm established within FADN, type "milk cows"/ Gospodarstwa w systemie FADN, typu „krowy mleczne"	Analyzed farm/ Analizowane gospodarstwo
Own arable land/Własne grunty orne	ha	12.8	15.0
Additionally leased arable land/Dzierżawione grunty orne	ha	3.9	6.1
Arable land evaluation rate/Współczynnik wymiany ziemi	-	-	1.0
Fodder growing area/Powierzchnia paszowa	ha	9.7	14.7
Total labour resources/Praca ogółem	h.	3 806.0	4 400.0
Milk cows/Krowy mleczne	S.D.	12.2	15.0
Pigs/Świnie	S.D.	0.3	0.0
Stocking density/Obsada	S.D./ha	1.0	1.2
Milk yield/Wydajność mleczna	kg/cow/ kg/krowę	4 658.0	4 700.0
Milk production per farm/Wydajność mleczna na gospodarstwo	kg	56 827.0	70 500.0

Source: own study based on Goraj 2010

Źródło: opracowanie własne na podstawie Goraj 2010

Table 3. Necessary investment activities for assumed development directions
Tabela 3. Konieczne działania inwestycyjne w założonych kierunkach rozwoju

Specification/ Wyszczególnienie	Direction 1 "Increase in milk production"/ Kierunek 1 „Zwiększenie skali produkcji mleka”	Direction 2 "Orientation towards the production of cereals and technologically similar plants"/ Kierunek 2 "Ukierunkowanie się na produkcję zbóż i roślin technologicznie podobnych”	Direction 3 "Orientation towards the cattle raising for meat"/ Kierunek 3 "Ukierunkowanie się na chów bydła mięsnego”	Direction 4 "Giving up agricultural production"/ Kierunek 4 "Rezygnacja z produkcji rolniczej”
Necessary investment activities/ Konieczne działania inwestycyjne	<ul style="list-style-type: none"> convert and enlarge the existing barn into a free-standing beddingless cowshed for milk cows/ przekształcić i rozbudować istniejącą stodołę w mlecznych convert the present cowshed into a milking hall, a room for milk storage/obecną oborę przekształcić na halę udojową, pomieszczenie do przechowywania mleka build on sheds for machines/dobudować wiaty na maszyny purchase in-calf heifers/zakupić jałówki cienne use the resources of own land for the production of bulky feed and additionally lease 7,8 ha GO/zasoby posiadanej ziemi wykorzystać do produkcji pasz purchase a tractor and machines for making hay/ kupić ciągnik i maszyny do sporządzania sianokiszonki target: 40 milk cows/stan docelowy krów mlecznych – 40 sztuk 	<ul style="list-style-type: none"> additionally lease 8 ha GO/dodzierzać 8 ha GO purchase a tractor and a seeder/zakupić ciągnik i siewnik build on sheds for machines/dobudować wiaty na maszyny purchase grain storage containers/zakupić zbiorniki do przechowywania ziarna zbóż 	<ul style="list-style-type: none"> convert and enlarge the existing barn into a free-standing beddingless cowshed for meat cows/ przekształcić istniejącą stodołę w oborę wolnostanowiską bezściolową dla krów mięsnych convert the present cowshed into a building for meat cattle/obecną oborę przekształcić w budynek dla bydła mięsnego build on sheds for machines/dobudować wiaty na maszyny purchase in-calf heifers Limousine/akupić jałówki cienne rasy Limousine use the resources of own land for the production of bulky feed and additionally lease 15 ha GO/zasoby posiadanej ziemi wykorzystać do produkcji pasz purchase a tractor and machines for making hay/ kupić ciągnik i maszyny do sporządzania sianokiszonki target: 40 meat cows/stan docelowy krów mięsnych – 40 sztuk 	<ul style="list-style-type: none"> find work out of the farm/znaleźć pracę poza gospodarstwem rolniczym sell machines and agricultural equipment, livestock, milk quota/ sprzedać ciągniki, maszyny i narzędzia rolnicze, zwierzęta, kwotę mleczną tease own arable land/ wydzierżawić posiadane UR
Investment outlays [PLN]/Nakłady inwestycyjne [zł]	446	120	380	-
Gain from disposal of fixed assets [PLN]/Wpływy ze sprzedaży majątku trwałego [zł]	12 000	21 000	21 000	180 000
Source of investment financing/Zródło finansowania inwest.	80% preferential credit. Payment period – 15 years/ 80% kredyt preferencyjny. Okres spłaty – 15 lat	80% preferential credit. Payment period – 15 years/ 80% kredyt preferencyjny. Okres spłaty – 15 lat	80% preferential credit. Payment period – 15 years/ 80% kredyt preferencyjny. Okres spłaty – 15 lat	-

Source: own study

Zródło: opracowanie własne

Possible development strategies of the analyzed farm

This article analyzes four development directions of the modelled farm with the potential and production range similar to the average farm engaged in milk production in Poland. The first analyzed path leads via the increase in milk production, which seems a natural solution for the farms already engaged in milk cattle raising. The second solution involves the farm orientation towards vegetal production (mainly cereals and technologically similar plants). This activity will result in the decrease of labour inputs. It will enable one family member to work out of the farm. The third solution is oriented towards meat cattle raising. Similarly to the second option there is a possibility for one family member to work out of the farm. The last analyzed possibility involves giving up the agricultural production: leasing the land as well as the sale of a part of the property (not all property can be successfully sold e.g. buildings) and work out of the farm. The above presented development directions produce specific investment effects (Tab. 3).

Economic results of the defined development strategies

The economic results of the assumed solutions can be evaluated in different ways. The article's author (in the introduction) suggests adopting the category of total income of an agricultural family. It is an economic category that includes farming income and non-farming income. Additionally the analysis will be completed with the information on the return on capital employed and

Table 4. The selected measures and indexes of economic efficiency of the indicated development directions of "average" farms engaged in raising milk cattle after the "changeover"

Tabela 4. Wybrane mierniki i wskaźniki efektywności ekonomicznej wskazanych kierunków rozwoju „przeciętnych” gospodarstw zajmujących się chowem bydła mlecznego po „przezwycięczeniu się”

Specification/Wyszczególnienie	Start/ Punkt startowy	Direction 1 „Increase in milk production”/ Kierunek 1 „Zwiększenie produkcji mleka”	Direction 2 „Orientation towards the production of cereals and technologically similar plants”/ Kierunek 2 „Orientacja w stronę uprawy zboż i techno- logicznie podo- bnych roślin”	Direction 3 „Orientation towards the cattle raising for meat”/ Kierunek 3 „Produkcja żywca wołowego”	Direction 4 „Giving up agricultural production”/ Kierunek 3 „Zaprzestanie działalności rolniczej”
Farm revenues [PLN]/Przychody [zł]	125 295	310 718	118 949	176 165	-
Gross value added [PLN]/ Wartość dodana brutto [zł]	30 153	141 939	30 665	44 568	-
Net value added [PLN]/ Wartość dodana netto [zł]	18 074	120 494	19 776	25 938	-
Farm income [PLN]/ Dochód z gospodarstwa [zł]	15 874	100 034	18 576	10 128	-
Total income of an agricultural family [PLN]/Całkowity dochód rodziny rolniczej [zł]	15 874	100 034	54 576	34 128	79 800
Return on capital employed [%]/Zwrot z zaangażowanego kapitału [%]	2.18	8.13	7.52	2.95	15.02
Work profitability [PLN/h]**/ Rentowność- pracy	3.61	24.64	12.40	7.76	18.14

* the return on capital employed was calculated on the basis on total income of a farmer and his family in relation to the capital employed in the activity/zwrot z zaangażowanego kapitału został obliczony na podstawie stosunku dochodu rolnika i jego rodziny w stosunku do kapitału zaangażowanego w działalność, ** profitability of work was calculated on the basis on total income of a farmer and his family in relation to the work outlays (in a farm and outside)/rentowności pracy została obliczona na podstawie dochodu rolnika i jego rodziny w stosunku do nakładów pracy (w gospodarstwie i na zewnątrz)

Source: own study

Zródło: opracowanie własne

work profitability. These indexes will allow relating to key resources frequently present in minimum in a farm, i.e. resource of work and capital. It should be emphasised that the economic results will differ depending on the period for which the analysis is conducted. Table 3 presents the economic results of the farm after a complete changeover. For the purpose of the calculation average market prices valid in 2009 have been adopted [Seremak-Bulge 2010].

As it can be concluded from the data included in table 4 the biggest income can be obtained by the farm that increases the stock of milk cows and thus the milk production (in the results presented the stock of milk cows assumed increases from 15 to 40 pcs). This solution contributes to the full use of labour resources in the farm, therefore leading to the relatively big labour profitability (biggest one among the solutions analyzed). The second solution in terms of economic attractiveness involves giving up the agricultural production. Commencing work outside the farm, leasing the land and gaining interest from long-term deposits resulting from the sale of fixed assets and chattels bring annual incomes amounting to PLN 79,800. The return on capital employed is in this option biggest and own labour profitability comes second.

After this (rather general) economic analysis a question arises: What may hamper "average" milk farms against a significant increase in milk production? One of the factors is a big demand for capital (especially foreign capital). It is accompanied by concern for solvency in the conditions of variable prices of milk and price of production means. The necessary investment outlays for the solution in question amount to PLN 44,600. They can be financed partly with the use of a preferential credit (80%) and own financial means (20%). Minimum demand for own means amounts than to PLN 89,200. However, frequently they are the means that are not present in farms. Financing of the investment activity with the use of structural funds (PROW – Rural Areas Development Programme 2007-2013) also faces the equity barrier. In most cases of investment activities performed within the framework of PROW 2007-2013 it is firstly required to implement a certain investment and then there is a possibility of its partial settlement within the framework of the above mentioned funds. The equity barrier and big economic and natural risk in relation to the agricultural production may result in further withdrawal of "average farms" from pursuing agricultural activity (milk production in particular).

Conclusions

1. The number of commercial milk farms has decreased successively in Poland. In the quota year 2004/2005 the number of farms producing milk for sale amounted to 323,664, whereas in the quanta year 2008/2009 there were only 186,820 (drop by 42%) of them. Nevertheless in Poland the global milk production growth can be observed which is evident of the increase in production of the milk farm.
2. Average commercial milk farm in Poland sold slightly above 49,860 kg of milk in the quota year 2008/2009. In the quota year 2004/2005 it was 25,760 kg.
3. The above presented analysis of development directions for the milk farm whose production potential and scope of production is similar to the average milk farm in Poland in 2009 shows that total income of the agricultural family (e.g. after a complete adaptation) may be biggest after a significant increase in milk production by the farm (from 70,000 to 240,000 kg). In terms of total income the option that involves giving up the agricultural activity seems slightly worse.
4. Considering the economic risk (manifesting itself mainly as the possibility of financial liquidity loss) and natural risk (resulting from the characteristics of farming) as well as the big demand for the capital indispensable to increase the production volume, giving up the agricultural production (work out of the farm) may seem to give "safer" income than the increase in agricultural production volume (particularly the milk production).
5. For the purpose of the milk farming development taking place in Poland certain actions must be taken that will perceive the specificity of milk production (high capital intensity and labour intensity). Earmarked financial means (structural funds or long-term low-percent credits) should be destined for the construction or modernization of farm buildings thus contributing to the increase in the production volume and the decrease of labour arduousness. The adopted method of direct allowances calculation per arable land hectare will, almost regardless of the type of production performed, lead to the situation where farmers will give up the activity requiring high intensity labour (including milk production).

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Streszczenie

W artykule przedstawiono strategię rozwoju dla gospodarstw zorientowanych na chów bydła mlecznego z roczną wydajnością 70 tys. l mleka z gospodarstwa. Jest to poziom produkcji zbliżony do średniego poziomu w Polsce. W artykule przyjęto cztery kierunki rozwoju: zwiększenie wolumenu produkcji mleka do 240 tys. kg/rok, hodowla bydła na mięso, produkcja roślinna i rezygnacja z produkcji rolnej. Z przeprowadzonych analiz wynika, że całkowity dochód rodziny rolniczej jest najwyższy w sytuacji zwiększenia produkcji mleka. Jednak biorąc pod uwagę naturalne i gospodarcze ryzyko, jak również duże zapotrzebowanie na kapitał, rezygnacja z produkcji rolnej okazuje się być najlepszym rozwiązaniem.

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