

## **THE RISK OF AGROTOURISM IN THE SYSTEM HACCP IN AGRICULTURAL PRIMARY PRODUCTION**

**Tadeusz Zarski<sup>1</sup>, Kateřina Kovářová<sup>2</sup>, Enikő Lőrinczová<sup>2</sup>, Miroslav Samek<sup>2</sup>**

*<sup>1</sup>Warsaw Agricultural University, Department of Animal and Environment Biology, 02-786 Warsaw, ul. Ciszewskiego 8; <sup>2</sup>Czech Agricultural University, Prague, Kamycka str. 270, Czech Republic*

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### **Introduction**

Agrotourism is a preferred way how to maintain the countryside social life, keeping country population home, outside from urban agglomerations. However, these trends have negative aspects as well, which may effect the agricultural primary production too. We may suppose that the system of food safety (HACCP) will be legislatively treated for the agricultural commodities as well, first of all more likely for the area of milk production (from 2007) and step by step for the eggs and meat production. The critical points assurance of these products will have to take into consideration the increased contacts of hygienic risk and in the increased extent the contacts of people from the epidemiologically unknown area – which is not monitored. There is a possibility of bad reaction because of direct contact with people, who have no steady behavior with animals. With this, the animal care routine and animal welfare may be affected and disturbed, with impact on livestock efficiency.

### **Material and methods**

The research was performed on the agricultural farm, which provides agrotourism along with the cow breeding. For the agrotourism it uses family facilities with 30 beds and a restaurant for 50 people. Tourists have an opportunity to get familiar with the cow breeding and obtaining milk from milk-cows. The model example of HACCP system was proposed for this farm in the area of milk obtaining. The production cow breeding contains 160 milk cows of Český strakatý breed (a special Czech breed focused on milk production) with average daily milk yield of 15 l and with increases of heifers 0,7 kg.

At this breeding, the quality of raw milk had been monitored in central laboratories for each month during the years 2000-2002. The milk quality was monitored by using indicators as the total number of microorganism and number of somatic cells, which are the most important criteria form milk realization. The dynamics of monthly arithmetical averages of these values were presented by graphics for the years 2000 – 2002. Next, the correlation between particular indicators (including component criteria as fat and protein content,

freezing point and number of coliform bacteria for raw milk) was calculated. This correlation proves the tightness of these particular indicators of raw milk quality. The statistical data processing was undertaken by using of software Excel.

## **Results and discussion**

The food safety is secured by implementation of critical points assurance – the system of HACCP. There is no legislative for the agricultural primary production. But there is an assumption, that from the year 2007 will be the implementation of critical points assurance required for the primary production of milk (Cervenka, Poděbradský 2004). It is just logical, that dairy works process milk to products intended for exacting markets, so they prefer suppliers, which in their breeding have chosen to implement the system HACCP voluntarily. The requirement of implementation should exist at the farms, which process their own milk their selves and selling it so called from their farmyard. To this activities should be included also farms, which are focused on agrotourism.

This agrotourism should contain the access of guests to foodstuff produced in the environment, which is a part of the farm. However, the side-effect connected with accommodation and offering services to guests and their existence could implicate negative and risk impact especially on the safety of milk.

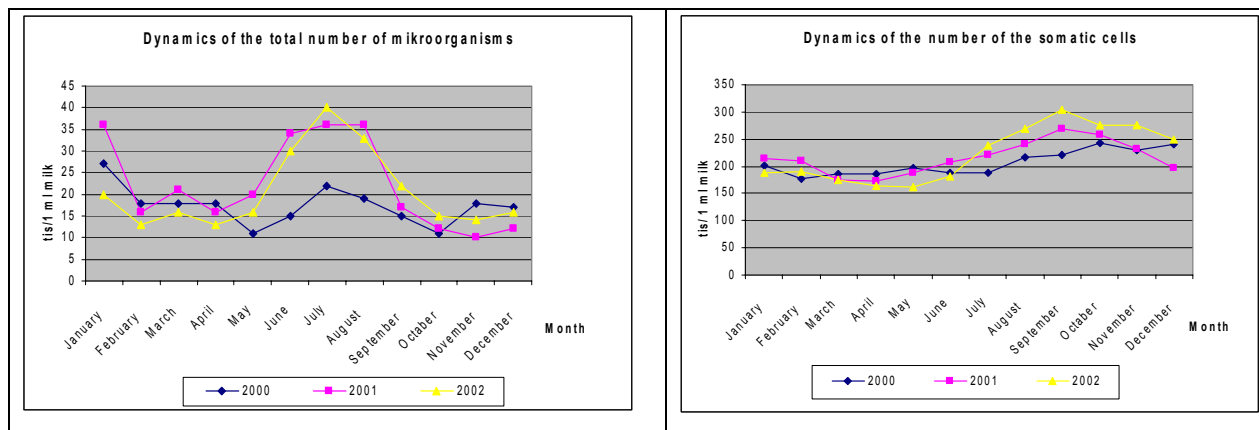
At the small farm, the system HACCP would consist of the risk analysis, monitoring and corrections for milk-cows, the actual period of milk obtaining and keeping the milk after its obtaining. If practicing the agrotourism at the farm, it is necessary to include the presentation of agricultural production to the guests to the model system. In the consequences, the animal care routine and animal welfare may be affected and disturbed, with negative impact on livestock efficiency and the quality of milk. (Gencurová and Hanus, 1997).

The milk quality is expressed by the number of microorganism and number of somatic cells, which are the critical criteria for milk realization, while the component indicators (the content of fat and proteins) serves to estimate the additions to the basic price of milk.

The total number of microorganism express the level of hygiene at the milk obtaining and treatment and at the same time its safety as well. This indicator is mentioned as a criterion, which is on the highest level depending on the quality of treatment care.

Somatic cell expresses the health condition of milk gland and has an influence on the milk composition. The seasonal changes of number of somatic cells is influenced in the higher percent by cows, suffering by milk glad irritation and their treatment, then changes of the feeding dose, deficiency of nutrition, influence of higher temperature, but especially by

variation of dairymen (Kopunecz, Roubal, Kadlec, 2003). From the view of monthly averages, there is a higher existence of somatic cells during the summer and in the beginning of autumn (graph 2)



The followed development at the mentioned indicators has the highest values in the period from May to September, which corresponds with the most frequented flow of tourist in the farm, which had an opportunity of physical contact with milk-cows in the so called model yard and which could partly follow the process of milk obtaining from milk cows.

By regressive judging of these followed marks of milk quality, the interaction is proved and the tightness of this interaction shows a significant level of positive dependence between the total number of microbes and number of somatic cells in the commented extent. For the completion, the functional relationship between other indicators are showed (chart 1). The data file with its representative ness notably proves the highly significant relationships of contextual components of fat and proteins, as the important criteria for cultivation. At the same time shows the significant direct dependence of values of nutrient indicators of milk cleanness (purity).

The statistical data processing makes possible to follow the partial relationships for the implementation of actual control proceedings, which would improve the milk quality and its better realization. Significant rising trend of number of somatic cells was proved during the summer months, while the total number of mikroorganisms was at its highest level during the winter months. Correlative regression proved their mutual relationship. The highest dependence of relationship was registered at the content of fat and proteins ( $r=0,56$ ). High dependence was found between the values of fat content and number of somatic cells. ( $r=0,49$ ), milk freezing point and number of somatic cells ( $r=0,40$ ).

Chart Nr 1: Correlation between particular indicators

Indicator		CPM	PSB	BM	Protein (B)	Lipid (T)	Coli (CA)
<b>Total number of microorganisms (CPM)</b>	r	1					
	r <sup>2</sup>	1					
	t	x					
<b>Number of the somatic cells (PSB)</b>	r	<b>0,332**</b>	1				
	r <sup>2</sup>	0,110	1				
	t	3,414	x				
<b>Point of milk frozen (BM)</b>	r	0,067	<b>0,404**</b>	1			
	r <sup>2</sup>	0,004	0,16	1			
	t	0,64	4,28	x			
<b>Protein content(B)</b>	r	0,067	0,230*	-0,214*	1		
	r <sup>2</sup>	0,004	0,053	0,046	1		
	t	0,645	2,294	2,124	x		
<b>Lipid content(T)</b>	r	<b>0,272**</b>	<b>0,489**</b>	0,224*	<b>0,563**</b>	1	
	r <sup>2</sup>	0,074	0,239	0,050	0,316	1	
	t	2,74	5,428	2,230	6,597	x	
<b>The number of coliform microbes (CA)</b>	r	<b>0,480**</b>	0,257*	-0,042	<b>0,294**</b>	<b>0,269**</b>	1
	r <sup>2</sup>	0,230	0,066	0,002	0,086	0,072	1
	t	5,303	2,577	0,410	2,979	2,704	x

e: r=correlation coefficient, r<sup>2</sup> = determination coefficient, t= test quantity of importance of the correlation coefficient, x = t residuum, \*\*r= statistically significant on the probability level α (0,05; 0,01), \*r = only on level α (0,05), r= statistically no significant.

## Conclusion

The analysis of indicators (characteristic for milk quality) proves the connection between the worsening of these indicators and the existence of agro tourist at the agricultural farm. Seasonal variation was recorded at the milk quality indicators during the month May – September, which corresponds with the most frequented flow of tourist to the farm, where these tourists had an opportunity of physical contact with milk-cows in the so called model yard and where they could partly follow the process of milk obtaining from milk cows.

The requirement of critical points assurance HACCP implementation would have to contain the possible risk arising in the farm as a result of this new activity.

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