

COMPETITIVENESS OF TABLE EGGS FROM NON-CAGE HOUSING SYSTEMS

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Abstract: Experiences of developed countries show that production costs in non-cage housing systems for layer hens are from 8 to 59%, and in organic production over 200% higher compared to production costs in the conventional cage system. Consequently, eggs deriving from non-cage systems can be competitive only provided that the consumers are willing to pay adequately higher price for eggs produced in said way. In this paper, 720 consumers were interviewed with aim to determine to what extent they are prepared to pay higher price for eggs deriving from non-cage systems. Obtained results show that over $\frac{3}{4}$ of consumers were willing to pay higher price for such eggs. This, however, was limited in majority of consumers (53%) to increase of price by up to 20%. This is enough to cover increased costs of production in the floor system, but not in case of free range system and organic production. Taking into consideration the fact that in EU, from year 2012, serious egg deficit can be expected due to the ban of housing of layers in battery cages, and that this deficit will probably be covered by supply from surrounding countries, it can be concluded that for certain number of producers transition to non-cage housing systems can be good business decision. For most of them, however, transition to so called enriched cages poses less risk, and in this production system they can expect premium price for egg with increase of production costs not exceeding 15%.

Key words: table eggs, price, competitiveness, non-cage housing systems

Introduction

Developed world countries, which include EU countries, pay significant attention to animal welfare. Numerous researches have shown that consumers find that animal welfare in poultry production is compromised more than in other livestock sectors (*Lagerkvist et al., 2006, Maria, 2006, EC, 2007a, EC, 2007b*). Therefore, it is no wonder that EU Regulation (*Council Directive 1999/74/EC*) starting from year 2012, fully bans housing of layers in conventional battery cages, which have been assessed as extremely deficient for poultry rearing.

Transition to alternative housing systems, which are allowed according to European legislation (enriched cages, floor system, aviar system, floor system with free range, organic production) according to many authors (*Pavlovski and Mašić, 1992; Jekić et al., 1993; Polet, 2005; Van Horne and Bondt, 2006; Van Horn, 2007; Rodić et al., 2009*) results in considerable increase of production costs, which subsequently seriously endangers the profitability of production and competitiveness of eggs produced in this way. Consumers in developed countries, who exhibited the pressure which resulted in changes of regulations, are willing to pay higher price for such eggs (*Bennett et al., 2002; Goddard et al., 2007*), which provides the economical justification of the production.

In Serbia, there is still no significant market production of table eggs in non-cage systems. This is consequence primarily of the absence of regulations which would require the producers to change the housing conditions and system. Current Law on animal welfare (*Official journal RS 41/09*) doesn't stipulate explicit ban on housing of layers in battery cages. In the Law it is stipulated that "animal owner, i.e. keeper is responsible for provision of adequate and safe housing of the animal, including micro-climatic conditions, hygiene, sufficient space, freedom to move, food and water adequate to species, breed, sex, age, physical, biological, production requirements and behavioural requirements of the animal." However, recently adopted Rulebook on conditions for animal welfare (*Official journal RS 6/10*) defined more closely housing conditions and regulates this sector entirely according to European Union. So, according to Article 53 of this Rulebook, "legal and physical entities, i.e. entrepreneurs can rear layer hens in not enriched battery cages until January 1st 2012".

Directive regulating this issue was adopted by EU in 1999, and ban was foreseen in two phases – from 2003 installing of battery cages was banned, and from 2012, housing of poultry in them will be banned. This directive was adopted under significant pressure of consumers, after they expressed their willingness to support improvement of layer welfare by paying higher price for eggs produced in alternative systems.

Issuing of such regulations in our country with deadline for implementation of less than two years and without verification of the presence of previously described condition whether consumers are willing to pay higher price for eggs from alternative systems, places the burden of animal welfare on producers. In conditions of very poor financial position, many producers of table eggs will encounter serious problems to endure it, which could endanger entire very sensitive sector. Therefore, information based on which they can make decisions will be of great importance to them.

Research in this paper is directed to study of the willingness of consumers to accept and pay higher price for eggs produced in non-cage housing systems, in order to assess the demand for these eggs and their competitiveness in Serbia. This

information is necessary, on one hand, so that at least one part of producers could recognize domestic demand and motivate to voluntarily make the transition to non-cage systems, and in this way be prepared for the ban of the housing in battery cage system. On the other hand, this would create conditions for gradual overcoming of initial difficulties occurring in transition to the new housing system and readily wait for the opportunity which can be expected after 2012 when significant deficit of eggs on EU market is expected. According to *Windhorst (2006, 2009)* this deficit will probably be compensated through import from surrounding countries, primarily those that are producing in compliance to same or similar standards. Starting from February 1st 2010 the Agreement of free trade is enforced establishing the zone of free trade between Serbia and EU, and it is not unrealistic to expect that Serbia could be one of the said countries. Even more so if we consider that production capacities of poultry production in Serbia are far from realistically possible or capacities which were present in the past (*Škorić, 2003; Rodić, 2009*).

Materials and Methods

In order to assess the willingness of consumers to pay higher price for eggs produced in non-cage systems (and on that basis reach the conclusion on need and justification for commercial production) consumers were interviewed. Study was done during summer of 2009, on sample of 720 persons, using technique of personal communication and semi-structured interview questionnaire. Collected data are primary information about interviewed persons, as well as facts, opinions and attitudes of consumers pertaining to consumption of eggs. Questionnaire contains 22 questions. First 6 questions refer to main social-economical traits of interviewees – ages, gender, place of living, education, net family income and participation in making of decisions about purchasing (Table 1).

In formulating of questionnaire tendency was to respect general rules (*Punch, 2003; Vlahović, 2004*), and questions were formed in such way to be as concise and clear as possible, adjusted to all age categories and education levels. Even though the main consideration was to ensure sample structure demographically adequate to main set this was not entirely succeeded for several reasons. Greater part of the sample in relation to main set were women (62.1%), which can be considered as acceptable in such studies (*Fearne and Lavelle, 1996; Vukasović, 2009*). Main reason is in the fact that women are mainly in charge of buying of food stuffs and preparation of food. Also, women are more interested than men for participation in interviews, polls, especially those where they can express their opinion on products.

Share of interviewees over 65 years of age (5%) and share of interviewees with incomplete or complete elementary education (7.6%) are lower than actual situation

in Serbia. Reason for this is more often refusal by consumers from these groups to participate in interview compared to other groups. Similar problems are described by other authors who are studying consumer attitudes (*Burton et al., 2001*) and this is certainly something that should be considered when reaching conclusions.

In order to ensure that sample adequately includes consumers from rural environments, large fair exhibitions in Belgrade and Novi Sad were used as locations for carrying out the interviews, since these events are visited by people all over the country. In this way participation of non-urban consumers was ensured at the level of 34%. It is slightly below the actual share of this population in total (43%) but it can be considered as acceptable.

Table 1. Structure of the sample (N=720)

Interviewees' characteristics		%
Gender	male	37.9
	female	62.1
Age	< 20	6.8
	20-35	33.0
	36-50	30.9
	51-64	24.3
	> 65	5.0
Region	urban	66.0
	non-urban	34.0
Education level	primary	7.6
	vocational	45.4
	high school or more	46.8
Net monthly income of the household	< 24.999 RSD	20.3
	25.000 – 49.999 RSD	34.6
	50.000 – 74.999 RSD	23.2
	75.000 – 99.999 RSD	11.4
	> 100.000 RSD	10.5
Responsibility for eggs purchases	the interviewee	42.5
	interviewee and other family member. equally	37.0
	spouse	17.9
	somebody else	2.6

The second part of the questionnaire pertains to facts, opinions and attitudes of the interviewees pertaining to consumption of table eggs. In the paper analysis is limited only to those questions relevant to reaching the conclusion on competitiveness of eggs from non-cage housing systems.

Collected data was processed using mathematical-statistical methods, common for this type of research, using program package SPSS.

As data source questionnaires and literature reference from this field were used.

Results and Discussion

Results of the interview show that although high percentage of interviewees (63.4%), answered the direct question »Is the housing system of layers important to You when purchasing eggs?« positively, only 7.6% of interviewees found the housing system as the most important criterion (Table 2). For the approximately same percentage of interviewees the most important criteria were size of the egg (8.7%) and price (7.7%).

But, the most important criterion (64.9%) in purchasing of eggs is their freshness, i.e. production date. This result is in accordance with results obtained by other authors (*Gonnier, 2009; Tacken, 2009; Pavlovski, 1981*) in similar studies.

Table 2. Main criteria when buying eggs

Main criteria	Percentage of interviewees
Housing system	7.5
Egg size	8.6
Price	7.6
Freshness	64.4
Shell appearance	5.8
Combination of more than one criteria	5.4
No answer	0.7

Most of the interviewees is not aware that in EU starting from 2012 housing of layers in battery cages will be banned, but find it justified and support implementation of compliant regulations in our country (Table 3).

Table 3. Interviewees' attitudes towards ban on battery cages (%)

Question	Yes	No	No answer
Do you know that in the EU battery cages will be banned after 2012	24.3	75.7	-
Is it, according to you, justified?	72.8	24.2	2.9
Do you think that such an abolition should be adopted in Serbia, too?	70.9	26.7	2.4

According to *Mašić and Pavlovski (1984)* 6.4% of consumers were for ban of battery cages at the beginning of eighties in our country, and decade later this percentage has almost doubled and in men it was 11.4%, and women 10.0% (*Pavlovski and Mašić, 1993*). Fact that in this study 70.9% of interviewees expressed them selves for ban of cages is a clear signal that similar like in developed world countries (*Magdelaine et al., 2008*) awareness about the animal welfare importance is developing in our country as well, so it can be expected that consumers will develop willingness to pay higher prices for products in whose production welfare was respected.

Considering the fact that presently supply of eggs from alternative housing systems in Serbia is very limited, question about the selection of housing system was hypothetical, i.e. »If you could choose, from which system would you rather purchase the eggs «.

Obtained results (Figure 1) show that in case of choice only 9% of interviewees would purchase eggs from conventional cages. Majority would choose eggs from free range system (51.2%) or organic production (26.4%). Such attitudes can be interpreted by traditional opinion that »real« eggs are those deriving from hens walking, but also fact that the government is intensifying the activities in promoting organic production and other forms of so called ecological agricultural production.

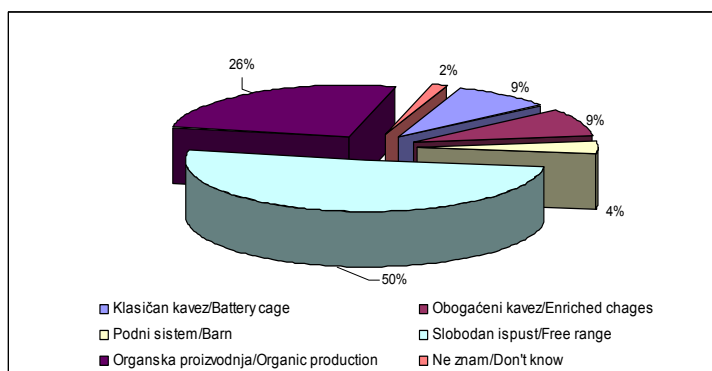


Figure 1 Consumers' preferences regarding housing systems

In accordance to previously presented attitudes, most of the interviewees (76.9%) is willing to pay higher price for eggs for which they know for certain that they derive from non-cage systems (Figure 2). According to *Pavlovski and Mašić (1993)* percentage of these consumers in the past was even higher (84%). Probably the decrease in the willingness can be attributed to decrease of standard of living since among those who are not willing to pay higher price for eggs deriving from non-cage systems share of people with lower income level is higher.

Percentage of those who are willing to pay higher price decreases with the increase of premium price. As presented in the graph, the highest willingness to pay higher price is present in case of relatively small price increase (up to 20%), which should not be surprising, considering relatively low standard of living in Serbia. At the beginning of nineties for instance, over 60% of interviewees were willing to pay up to 10% higher price, and 20% were willing to pay 20%, 30% or more for eggs from non-cage housing systems (*Pavlovski and Mašić, 1993; Mašić and Pavlovski, 1994*).

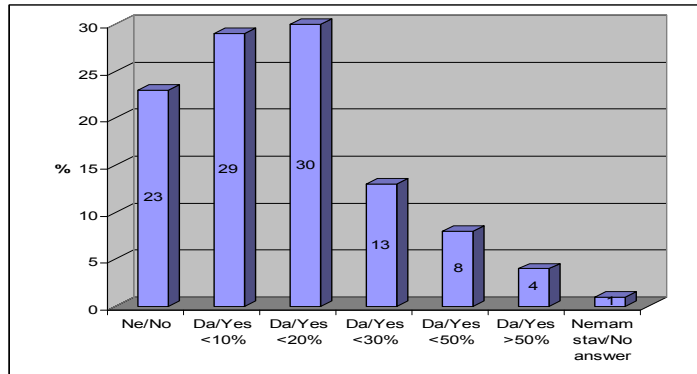


Figure 2. Consumers' willingness to pay more for non-cage eggs

According to the experiences of EU countries, increased production costs in non-cage systems are from 8 to 59%, and in organic production over 200% (depending on the author and investigated housing system) higher than conventional cages (Table 4). Great differences obtained in domestic researches and those carried out in Western countries are consequence of the fact that domestic authors haven't included in the calculation cost of the lease of land (since it was non-commercial extensive production in small flocks in rural households, where layers were reared on area not only intended for that purpose), whereas in Western countries these costs represent significant item and must certainly be taken into consideration for commercial production.

Table 4. Percent increase in running production costs relative to battery cages

	Enriched cage	Deep litter	Free range	Organic production
<i>Mašić and Pavlovski (1994)</i>	-	-4	5	-
<i>Elson (2004)</i>	8-12	12-18	40	-
<i>Fisher and Bowles (2002)</i>	-	8-24	26-59	-
<i>(Tacken et al., 2003; Van Horne, 2003)</i>	13	21	38	-
<i>(AGRA CEAS, 2004)</i>	-	26	45	>200

In order to ensure profitability, and in this way competitiveness of non-cage production, increase of sale price must be higher than increase of production costs, since non-cage housing systems by rule have lower income (because of increased mortality, less class I eggs and lower feed conversion), and costs of organization and collection of eggs in such systems are higher. This practically means that selling price increased by 20% can barely cover increased production costs in floor system

(provided that technological norm of developed countries was realized), but not in the system with free range or organic production. Producers who would like to make the transition to free range systems or even organic production can count on those consumers who are willing to pay up to 50%, and over 50% higher price, and according to our study it is only 8 and 4%, respectively.

For certain number of producers transition to non-cage housing systems can be good business decision since there is market niche for eggs produced in this way. For most of producers, however, less risky is transition to enriched cages, where they can count on premium price, without increase of production costs exceeding 15%.

Considering low level of standard of living and economical crisis in the country, for serious development of commercial production in non-cage systems it is necessary to access foreign markets, primarily EU market, since because of the proximity of the market and easier transport of eggs in egg shell we have advantage over other world exporters of eggs outside EU (China, USA, Malaysia, India).

Help of the government, in form of export support, as well as investment into new production systems is desirable and it would significantly accelerate the development of alternative housing systems.

Conclusion

Numerous consumers in Serbia are not aware that housing of layers in conventional cages will soon be banned. However, significant number of interviewees thinks that such a ban should be introduced in Serbia, which confirms that trends present in developed countries are present here. Such consumers represent significant market niche and as demonstrated by this study they are willing to pay higher price for eggs deriving from non-cage housing systems.

It is known that for profitability, and at the same time competitiveness of certain enterprise, besides the production costs also the selling price is of utmost importance, the price for the product that can be obtained on the market. Results of the interview carried out on representative sample show the willingness of consumers to pay higher price which would only be sufficient to cover increased production costs in floor systems, according to experiences of EU countries. Prerequisite, of course, is to reach the technological level of production present in EU countries, and this will take certain time.

In free range system and organic production, however, increase of production costs is significantly higher, and willingness of consumers to pay over 50% higher price is limited. This means that producers who intend to make transition to free range systems or organic production must gain access to very limited market, which doesn't mean that they cannot succeed.

In any case, if the domestic supply of eggs from non-cage systems is not created, domestic demand will be satisfied by imported products, as soon as the conditions for it are created, and expected deficit on EU market will be covered by someone else.

For most of producers, however, making transition to enriched cages poses less risk, since they can count with obtaining premium price for such eggs, with increase of production costs not exceeding 15%.

In our country, presently, system of control and indication of eggs is still not developed, and prices are not depending on the implemented housing system. This is certainly one of the reasons why these forms of production are not developing. Problem of control and indication must be systematically solved and will be accompanied by differentiated prices for eggs deriving from different housing systems. Without this, production cannot be economically justified, except if significant assistance by the government is not ensured, and this is not realistic expectation in present conditions.

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Konkurentnost konzumnih jaja iz nekaveznih sistema držanja

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Rezime

Iskustva razvijenih zemalja govore da su troškovi proizvodnje kod nekaveznih sistema držanja nosilja od 8 do 59%, a kod organske proizvodnje i preko 200% veći nego kod klasičnih kaveza. Zbog toga jaja iz nekaveznih sistema mogu biti konkurentna samo pod uslovom da postoji spremnost potrošača da za ovako proizvedena jaja plate adekvatno veću cenu. U radu je izvršeno anketno ispitivanje 720 potrošača, s ciljem utvrđivanja njihove spremnosti da za jaja iz nekaveznih sistema plate veću cenu. Dobijeni rezultati pokazuju da je preko $\frac{3}{4}$ potrošača spremno da za takva jaja plati veću cenu. Ova spremnost, međutim, ograničena je kod većine potrošača (53%) na povećanje cene do 20%. To je dovoljno da se pokriju povećani troškovi proizvodnje u podnom sistemu, ali ne i u sistemu sa ispustom i organskoj proizvodnji. Uvažavajući i činjenicu da će se u EU posle 2012. godine, zbog zabrane držanja nosilja u baterijskim kavezima, javiti ozbiljan deficit jaja, koji će verovatno biti zadovoljen iz zemalja iz okruženja, može se zaključiti da za

određen broj proizvođača prelazak na nekavezne sisteme držanja može biti dobra poslovna odluka. Za većinu je, ipak, manje rizičan prelazak na obogaćene kaveze, kod kojih se ne može računati na premijsku cenu, ali ni povećanje troškova nije veće od 15-tak procenata.

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