

ECOLOGICAL AND ETHOLOGICAL ASPECTS OF PIG PRODUCTION IN CROATIA

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ABSTRACT

As consciousness about significance of preserving environment around farms and welfare of farm animals is increasing every day, ecological and ethological aspects are becoming more important in making decision about ways of pig production. Intensive farming has shown its weaknesses through low resistance of pigs and occurrence of new diseases. On the other side, low production coming from high number of small producers in Croatia is not acceptable due to the low competitiveness and huge amount of imported pork. The solution is seen in redirecting ground properties to those who are younger, educated and willing to produce much through “Enlarging Ground Properties” program, which should increase domestic pig production by better genetics and living condition in middle sized family farms. This should have significant influence on improving ecological and ecological aspects of pig production in Croatia.

Key words: pigs / pig production / ecology / ethology / animal welfare / housing / Croatia

EKOLOŠKI IN ETOLOŠKI VIDIKI REJE PRAŠIČEV NA HRVAŠKEM

IZVLEČEK

Z zavedanjem pomena varovanja okolja ob posestvih in dobrega počutja živali, se je pri odločanju o načinih reje prašičev potrebno ozirati tudi na ekološke in etološke vidike. Zaradi intenzivnega farmskega načina kmetovanja se je odpornost prašičev zmanjšala in pojavile so se nove bolezni. Vendar pa tudi veliko število majhnih proizvajalcev na Hrvaškem ni sprejemljivo zaradi premajhne konkurenčnosti ob velikih količinah uvožene svinjine. Možna rešitev je v preusmeritvi zemljiške lastnine na mlade, izobražene in dela voljne ljudi s pomočjo programa “Enlarging Ground Properties”, ki bi lahko vplival na povečanje domače priraje prašičev z boljšo genetsko osnovo in boljšimi rejskimi pogoji na srednje velikih družinskih kmetijah. To bi lahko pomembno vplivalo na izboljšanje ekoloških in etoloških vidikov reje prašičev na Hrvaškem.

Ključne besede: prašiči / prašičereja / ekologija / etologija / dobro počutje / uhlevitev / Hrvaška

INTRODUCTION

Up-to-date intensive swine husbandry is implicated by numerous problems. The most important aspects are those that we are generally considering as ecological or ethological. Agglomerations consisted of many thousands of pigs kept in closed barns, as well as unilaterally directed production, are constantly threatening to animal welfare and health status of such population (ethological aspects) and are potential risk to environment (ecological aspects). Such industrial way of swine breeding is a result of increased demands from human population, which has grown in number and feeding needs.

Occurrence of new diseases in intensive pig production, as well as disappearing of autochthonous breeds, are determining decisions about which directions should Croatian swine husbandry go to in the future. Due to increased consumers' care about living conditions of pigs and decreased popularity of highly intensive farming, being behind European achievements could be considered also as an advantage for Croatia in this moment (Antunović, 2003).

SITUATION IN CROATIAN SWINE HUSBANDRY TODAY

Agriculture (including feeding industry) participates with a little bit less than 10% in Croatian GDP (Gross Domestic Product). For a long period of time, Croatian agriculture has been characterized by the two models of land ownership. Agricultural recourses were directed toward small number of huge agricultural properties owned by the Government. In the same time, small family properties were restricted in size and therefore considered as "other" or "marginal" producers. The result was non standardized structure of properties. Most of them are today rather small and not able to make enough profit that could increase their living standard, as well as participate in investments on properties. This situation has resulted in food import to Croatia worth 300 millions \$ only during the year 2003.

Size of pig farms is one of the most important aspects that can influence ecology. Despite the fact that family properties in Croatia are individually small, they possess approximately 80% of agricultural recourses (land, farm animals etc.). However, greatest part of agricultural land has not been utilized rationally, animal husbandry has been carried out mostly in barns that are not in accordance with EU ecological demands (Antunović *et al.*, 2004a) and most of them are not suitable for renovating (Antunović *et al.*, 1999). Around 76% of pigs in Croatia are kept on small family properties, with low technology level, daily gain and average meatiness under desired (Kralik *et al.*, 2004). While in highly developed countries as Netherlands 25% producers keep from 100 to 200 sows per farm, in Croatia around 75% family "farms" keep up to five sows per farm.

It is important to notice that even in the EU-15 countries pig farms vary considerable in size. Across those countries, 67% of sows are in units of more than 100 sows. While in Belgium, Denmark, France, Ireland, Italy, the Netherlands and the United Kingdom this figure is over 70%, in Austria, Finland and Portugal smaller sow units are predominant. Furthermore, the majority of pigs for fattening (81%) are reared on units of 200 pigs or more, with 63% of them on units of more than 400 pigs. Around 31% of fattening pigs are reared on holdings of more than 1000 pigs. While the industry in Italy, United Kingdom and Ireland is characterized by units of more than 1000 fattening pigs, Germany, Spain, France and the Netherlands have significant proportion of pig units of between 50 and 400 fattening pigs. These numbers indicate that relatively small number of farms will fall under the scope of the IPPC (Integrated Pollution Prevention and Control) of European Commission from 2003.

Not many family properties in Croatia are capable to compete with importing. Moreover, most of them are older and not educated in farm management, which have a great impact on ecological and ethological aspects of production.

As a result, swine breeding in Croatia is characterized by oscillations in production due to price cuts and import. In average, Croatia is producing 21 kg and consuming 25 kg of pork per inhabitant, while in developed countries this number is twice or more times higher. Despite of the rate of sufficiently of 80%, due to the low price in European market (especially in Denmark and Netherlands) Croatia has imported 1 632 tons of live pigs and 11 921 tons of pork only during the first six months in year 2003.

POSSIBILITIES FOR IMPROVING ECOLOGICAL AND ETHOLOGICAL ASPECTS OF PIG PRODUCTION IN CROATIA

Today, the Government is giving central role in agricultural politics to the prosperity of family properties. Responsible ministries are trying to increase domestic food production, decrease import and adjust production to EU demands (EC, 1991; EC, 2001a; EC, 2001b). For that reason, it is important now to distinguish producers that could be capable to increase their properties from those that are older and producing only for themselves. While the first ones will get stimulus for their production from the Government or local head offices, the second ones will become social category and get some kind of pension. By getting this pension, small producers will not be stimulated to produce and will sell their ground to those who are younger, educated and willing to produce much. This process is called in Croatia “Enlarging Ground Properties” and should increase domestic pig production by better genetics and living condition, which will have significant influence on improving ethological and ecological aspects of pig production. In the period from year 1991 till 2003, number of husbandries having 10 ha of ground increased from 12 000 to 21 000, with average ground units of 2.4 ha per husbandry. Taking in account averages of 18.7 ha in EU countries before 1 May 2004 (from 4.4 ha in Greece up to 67.7 ha in United Kingdom), it is to be concluded that the situation is still far away from satisfactory.

In the process of enlarging ground properties in Croatia, it will be important to avoid building big farms that are hard to control in ecological and ethological way. The samples of bulky pig farms that had been producing up to 100 000 fattened pigs per year in non-stop production were “Sljeme” near Zagreb (now abandoned) and “Belje” in Darda near Osijek (never came back to the capacities obtained before the War 1991). Even the small omissions in management or feeding in big farms can disturb living conditions, which can cause considerable problems to production and health status of pigs. In such conditions we rarely find clinically recognizable and microbiologically defined infectious diseases. Instead of them, we are often hearing about occurrence of new “high production diseases” or “conditional diseases” (Pauković *et al.*, 1990; Antunović, 2000), which are maintaining themselves in production in almost invisible way, hidden behind opportunistic infections and waiting there for even the smallest possibility for breaking out. Therefore, more important role are playing facultative or conditionally depending pathogenic microorganisms, which are capable to cause diseases only if living conditions and stress resistance of pigs were disturbed. Relevant experts and authorities in Croatia are now pointing out that welfare in pig production is much depending of health protection and prophylactic measures. Of the same importance are immune-prophylactic measures and general prophylactic measures, as well. Omitting or ignoring one of them decreases efficiency of other measures (Vinković *et al.*, 2004). Generally speaking, intensive farming would not be possible without usage of various vaccines, as well as without controlling of housing conditions, proper feeding and care of pigs from the day of born till the end of production cycles.

Health control and hygienically and sanitary measures on pig farms in Croatia are much depending on technological specificities and infrastructure of barns. Proper ventilation is playing important role in maintaining optimal microclimate (reducing air pollution) and health status in pigs. The role of ventilation system in causing respiratory diseases still needs to be more investigated. However, no matter how technological solutions are carried out on the farm, ventilation in closed barns must be capable to bring enough oxygen and in the same time reduce air pollution. Besides regulating air temperature, the air flow should be controllable as well. On the other side, improper ventilation combined with high density population increases number of microorganisms (viruses, bacteria, fungi, mildew etc.), concentration of harmful gases (ammonia, carbon dioxide etc.), as well as other pollutants, well known of their negative effect on protective mechanism of respiratory tract. The positive moment we find in the fact that many viruses and bacteria, as primary pathogens for respiratory organs, die within few seconds when

exposed to the air (Webster, 1989). Exactly this is the reason why only few etiological factors are capable to cause alone some recognizable disease of respiratory tract. Instead of that, in most cases mixed infections combined with ruined resistance caused with improper living conditions play the most important role in pigs' health (Vinković *et al.*, 2004).

Concerning gas air pollutants in pig farms, Croatian experts are advising that ammonia concentration should not exceed 10 ppm and carbon dioxide concentration 0.2 vol% (Sviben, 2001). According to the regulations (Pravilnik..., 1993), the maximum allowed concentration of ammonia in working rooms for humans is 25 ppm or 18 mg m⁻³. Strange fact that suggested highest concentration in pig farms are lower than those in working rooms for people should be respected as pigs are constantly exposed to ammonia, while humans are exposed eight hours times five working days in a week (Wathes *et al.*, 1984). High emission of gas pollutants from pig farms can significantly disturb balance in the nature (Seedorf, 2004). Beside negative effects on working staff and pigs on the farm, plants and forests nearby intensive farming units can also be endangered (e.g. leaves necrosis). Furthermore, considerable ecological problem caused by high ammonia emission can be found in souring and eutrophication of ground and water. Greenhouse gases responsible for climate changes as CH₄ and N₂O are products of intensive farming as well. However, they are more originating from cattle than from pig farms. Improper ventilation systems are emitting bio-aerosols consisted from organic material (proteins), biologically active materials (endo-toxins) and even gases (ammonia) adsorbed to their surface. Therefore, those bio-aerosols are presenting infectious, allergic and toxic matter capable to disturb health status of exposed farmers (Brkić, 2004) and people around such farm.

Moreover, technological improvements and new solutions, as well as routinely usage of various pharmaceutical products, have marginalized hygienically and sanitary measures. We are the witnesses of disturbances in pigs' health status even in farms that seem to have optimal conditions for pigs. Praxis has shown that many sick animals do not react on therapy. We find the reason for that in multi-causal character of greatest number of diseases, as well as in increased resistance of causal on medicals. These problems are spreading out from the farms and getting public health dimension recognizable by terms "resistance" and "residua".

Even the traditional swine husbandries can become source of some public health threatening diseases. For instance, due to none carrying out the measures for eradication (proper veterinary and sanitary control, rodent control system, proper waste, confiscate and corpse removing), trichinellosis in East Slavonia was a serious ecological problem during and after the War in Croatia 1991–1995 (Florijančić *et al.*, 2002).

Industrial ways of swine husbandries based on old technology have survived until today in Croatia. In the same time, new, similar husbandries, but based on modern technologies, have been built. Some of them are successfully combining nearly forgotten ways of fattening pigs on straw in modern barns, which is a good way to avoid stereotypes, frustrations and conflicts between pigs and in the same time increase daily gain (Margeta *et al.*, 2004). However, removing of manure, wasted water and air, corps of animals etc. (only one removing unit in whole country) are still potentially weak ecological points in production, which is the topic of interest not only to animal hygiene, but also to public health.

Due to greater demands for ecological products from inland, as well as from international market, this way of breeding is foreseen in Croatian swine husbandry as an interesting alternative to conventional way of breeding in forming competitive husbandry. Eco-producers will have to apply even more strict regulations compared to conventional producers. However, benefits of ecological production could be found in breeding genetically more resistant swine breeds that do not have great demands concerning housing. The Government is now giving stimulus to those producers who breed endangered autochthonic Croatian breeds Black Slavonian Pig and Turopolje Pig. Orientation to producing final dry products instead of producing pork could bring producers in Croatia money from European market, which could be invested in better ecological

and ethological standards on such farms. Recently confirmed autochthonic Croatian product “Slavonian Kulin” is a good sample.

CONCLUSION

Big intensive pig farms are today exposed to temptation because of minimally two mutually opposing reasons. First of them is preserving ecological and ethological criteria important for welfare standards in artificially made living conditions. The second is demand for high quality animal products with minimal influence of their by-products on environment. This means that animal science specialists’ knowledge about preparing food and its quality, genetics and productive characteristics and needs of each breed should be in coordination with veterinarians’ knowledge about prevention, diagnostics and healing of pigs and in respect to other related professions, as doctors, feeding technologists, architects etc. (Antunović *et al.*, 2004b). In order to avoid needless conflict of competences and to harmonize and precise control and proper removing of animal waste and by-products, it is necessary to synchronize overlapped legislative in Croatia. Multi-discipline approach should be the basis for up-to-day swine husbandries that are in accordance with ecological and ethological aspects. Balancing between preserving traditional swine farming through breeding original autochthonic breeds as well and producing recognizable Croatian pig products and building middle sized modern farms with intensive production that respect those aspects will be the main direction of agriculture politics in swine husbandry in the period of joining EU.

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