

INFLUENCE OF GROWING AND EXPLOATATION OF BOVINS ON REGIONAL AGROECOSYSTEMS

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ABSTRACT

Scientists all over the are concerned regarding the influence of growing ruminants on regional agro-ecosystems due to green house gases resulted (CO₂, CH₄, N₂O₅). Cattle have contributed to environmental pollution in old industrial farming systems, when the cattle number in Romania, reached 8 million, manure evacuation was not solved and manure was accumulating around the farm polluting the soil, water and air. Low density of ruminants existing in the agricultural sector of the country is not significant in terms of pollution. Currently cattle have positive effects on the environment by the use of legumes, grasses and manure production contributing to the increase of agricultural production: crop production (sugar beet, potato and cereals), animal production (milk, meat, leather production) and industrial production also (biogas, befouls, alcohol, oil production).

Keywords: cattle, environment, density, pollution, manure

1. Introduction

We believe that ruminants number, especially cattle witch in our country is only 2.7 millions, will increase in the future, because: they don't compete with humans for resources and food, using biomass (grass) production, they offer the largest amount of protein in milk, meat, the best quality in lather production, they create a significant amount of manure (12t/1 UVM) which incorporated in soil can balance agro ecosystems.

Small, medium and big farms, with a purge and discharge system in the city canals, pollute the environment less, because the entire amount of manure is transmitted on the fields. Ecological farms have a special statute, about the relationship with environment, the use of fertilizers; the use of traditional methods, but still efficient and active, soil, air, water and forest protection, conservation of existing varieties and local breeds.

To complete the European standards farms which are during the modernization and sanitation have to respect a series of regulations about: hygiene quality of milk and food, farm locations, the distance to cities and other human settlements, manure management, farm management and marketing and sales management.

In order to decrease to reduce negative impact of conventional agriculture new systems of

agriculture were develop. One of these systems is organic farming.

Organic farming objectives:

- Environmental objectives:

Minimize negative environmental impacts on agricultural production;

Soil fertility improvement and erosion prevention;

Protection of water resources and aquatic life;

Biodiversity and landscape conservation; [13,14]

- Crop production objectives:

Avoids synthetic pesticides and easily soluble mineral fertilizers;

Protects the environment and promotes biodiversity;

Produces healthy food;

Recycles nutrients;

Uses locally adapted methods; [2]

- Organic livestock objectives:

Use of organic feed;

Number of animals linked to available land;

High priority for animal welfare (e.g. adequate housing);

Priority for natural veterinary medicine; use of allopathic only when no other solution exists;

Animal manure must not become a source of pollution;

Healthy, good quality milk, eggs and meat, instead of maximum quantities; [1]

- Socio economical objectives:

To develop a sustainable agriculture system for guaranteed adequate food production in the foreseeable future; [15]

To develop self-sufficient agriculture system which would rely as much as possible upon resources from within its own resources; [15]

To develop an alternative strategy over chemical farming which would be a guideline for the working of biological processes in natural eco-systems; [15]

Enhance rural development;

Use of renewable energy resources;

Food, feed, labor and industry market diversification;

Increase of labor efficiency;

Restoration of traditional material and spiritual values.

This article presents sequences regarding ruminants production specially those referring to the influence of growing cattle on regional agro ecosystems, most of them recorded during trials which took place at Research and Development Station for Cattle Breeding – Târgu Mureş.

2. Experimental procedure

Research Station for Cattle Breeding Tg. Mureş (SCDCB Tg. Mureş) was founded in 1947 and became in the year 1975 a modern “up to day” research station in animal husbandry- bovines – embryo transfer - physiology – meat and milk quality and later on genetic engineering.

Due to the strategic reasons and the accuracy of results obtained SCDCB Tg. Mureş was and is involved in national and international research projects. Foreigner partnership is represented by an international project participation together with the Research Institute of Gödölö University – in Hungary – as a result of Bilateral Cooperation (COPBIL).

The projects approach vital aspects of animal husbandry, milk and meat quality, improvement of growing technologies and food quality and safety. Animal raising based research is added research in plant improvement that is accomplished with ICDP Brasov, SCDA Turda, and ICDA Fundulea, financed by CEEX, PN II, and CNCSIS.

During these years of trials and projects researchers using different methods measured, determined, established correlation and based literature studies accumulated information

regarding the influence of ruminants on environment.

3. Results and discussions

Production quantities of manure (manure), on average 7500-8000kg per 1 LU is equivalent to 56.7 tons per year of nitrogen, 20kg phosphorus and 40 kg potassium salt. Increasing legumes surface (clover, alfalfa, and mixtures) synthesizes and stores in the soil a quantity of 100 kg nitrogen clean, and the consumption of cow fodder legumes, necessary and asilament, increases protein content in ration. Full use of pastures and meadows biomass, unused for other species, and transformation in animal products are other benefits. Correlations between the density of cattle per 100 hectares of agricultural land and production per hectare for the main agricultural crops: wheat, corn, sugar beet, potatoes is positive. Studies have shown negative correlations between increasing consumption of milk and dairy products and alcohol to young. Restoration of useful floral structure, natural grasslands and sub-mountainous area can be done by using old methods of fattening (slippers, manure, purine). Exploitation of ruminant animals for transforming biomass in diverse cattle, buffaloes, sheep, goats, zebras production is a model to increase the degree of eco biodiversity.

Some basic characteristics of old industrial farming systems which polluted the environment:

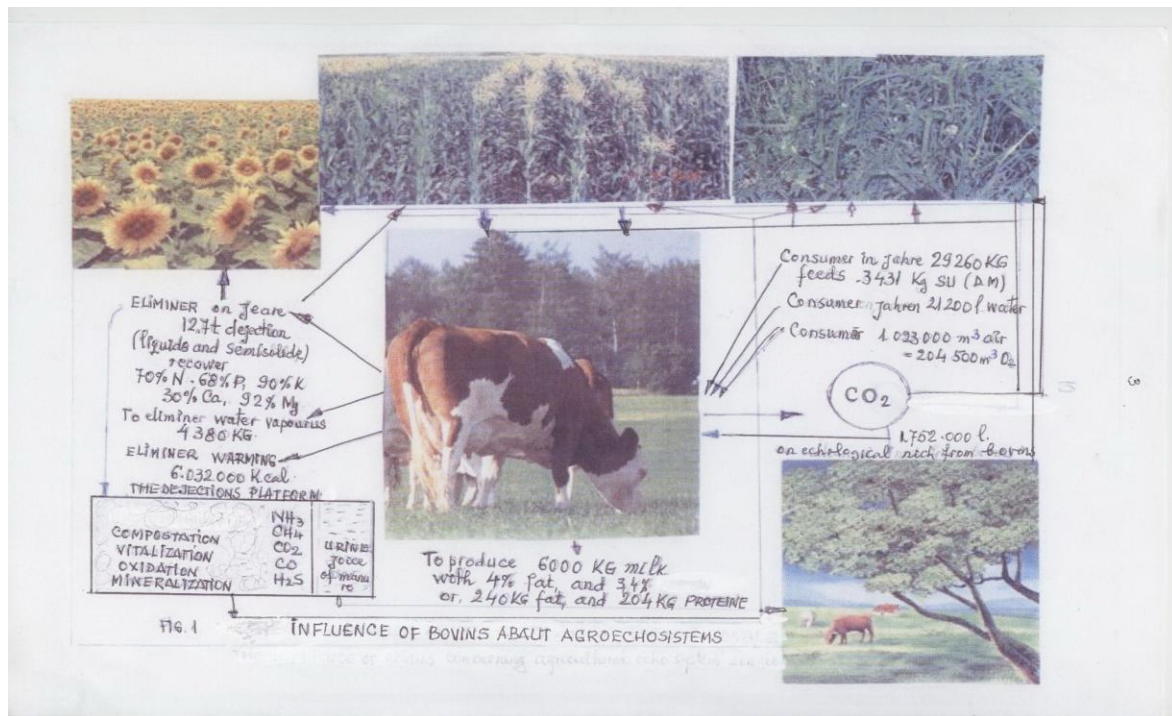
- High concentration of animals
- Increasing production and productivity
- Large supplies of feed
- Energy-intensive

• Problem of manure (10-20%) for use in fertilization, because of infiltration polluted natural environment

• Manure polluted human settlements, air, soil surrounding groundwater

• Removing involuntarily the circuit of 10 hectares of arable land around the farm, polluted with garbage, various objects: wires, plastic bottles various dead animals, pathogenic bacteria, viruses, rickettsiae, parasites - eggs and larvae that are transmitted through water the environment.

Sustainable, organic farming and GAP directions applied in farms will not have benefic effects only on environmental protection but will allow also economic growth having positive impact on animal welfare quality of life and landscape attraction.



Conclusions

Cattle do not pollute the environment, only in context of large industrial complexes, when the escape of manure was only partially solved. Increase the density of cattle at 100 ha arable land has favorable effects on growth of sugar beet, potatoes, wheat production on Ha. Legumes need to fulfill necessary protein for milk production has a benefic effect on soil fertility increasing N content with 50-200 kg / year active ingredient. Bovines complete zonal ecological landscapes with positive influence on soil, environment and humans.

References

- [1] A. Benzing, B. Schulz, U. Findel, 2010 "Brief Introduction to Requirements for Organic Livestock Production according to European Regulation (EC) 834/07, the US National Organic Program (NOP), and CERES standard interpretation" CERES Certification of Environmental Standards GmbH 3.2.2e Inf.;
- [2]. A. Benzing, B. Schulz, U. Findel, 2010 "Brief Introduction to Requirements for Organic Crop Production according to European Regulation (EC) 834/07, the US National Organic Program (NOP), and CERES standard interpretation" CERES Certification of Environmental Standards GmbH 3.2.1 e Inf.;
- [3]. Georgescu D. (1987) – *Prezent și viitor în creșterea bovinelor*, Ed. Ceres, București

- [4]. Georgescu Gh. – coordonator (1988,1989,1995) – *Tratat de creștere a bovinelor* Vol. I, II, III, Ed. Ceres, București
- [5]. Iurubescu V. (1977) – *Reciclarea nepoluantă a reziduurilor zootehnice*, Ed. Ceres, București
- [6]. Man C., Podar C., Ivan II. (2002) – *Ecologia exploatarei taurinelor*, Ed. Academic Press, Cluj Napoca
- [7]. Podar C., Roman M. (1993) – *Inflența creșterii bovinelor asupra agroecosistemelor, Lucrările Simpozionului, Factorii de mediu, producția și sănătatea animalelor*, Tg. Mureș, III 19-29
- [8]. Podar C., Silvaș E., Roman M., Markus Șt. (1982) – *Aspecte ale poluării în fermele de taurine și măsuri de protecție a mediului înconjurător*, Simpozionul Agricultură-Alimentație-Ambianță, Cluj Napoca pg. 69-71
- [9]. Puia I., Soran V. (1981) – *Agroecosistemele și alimentația omenirii*, Ed. Ceres, București
- [10]. Papacostea A.P. (1981) – *Agricultura biologică*, Ed. Ceres, București;
- [11]. Ionescu Al. (1983) – *Agricultura ecologică*, Ed. Ceres, București;
- [12]. Saller Wistinghansen (1994) – *Ferma biodinamică*, Ed. Enciclopedică, București;
- [13]. *** REGULAMENTUL (CE) NR. 834/2007 AL CONSILIULUI din 28 iunie 2007 privind producția ecologică și etichetarea produselor ecologice, precum și de abrogare a Regulamentului (CEE) nr. 2092/91;
- [14]. *** REGULAMENT (CE) NR. 889/2008 AL COMISIEI din 5 septembrie 2008 de stabilire a normelor de aplicare a Regulamentului (CE) nr. 834/2007 al Consiliului privind producția ecologică și etichetarea produselor ecologice în ceea ce privește producția ecologică, etichetarea și controlul;
- [15]. www.tarahaat.com/Organic_Objectives.aspx.