CONTENT

RESEARCH ON THE DYNAMICS OF ORGANIC ACIDS IN APPLES DURING THE STORAGE TIME

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Abstract
Harvesting apples must be carried out at the optimum time, established by a series of quality indicators, among which the malic acid content.
During the storage time, the values of these indicators vary, closely related to the storage conditions. Studying the behaviour of different apple varieties during the storage period allowed the development of specific technologies, in order to limit the quantitative and qualitative loss of fruits.

Key words: apple, total titratable acidity, storage, storage conditions

INTRODUCTION

Organic acids are spread in all fruits and vegetables, being dissolved in free state or combined as salts, esters or glycosides, representing intermediates in carbohydrate, lipid and proteic metabolism and working as hydrogen acceptor or oxidative substrate in the respiration process.

The acid taste is perceived as slightly sour, given to horticultural products by organic acids, represent a major and valued part of organoleptic (sensorial) quality.

Knowing the acidity allows us to better anticipate a product's evolution, from the optimal harvesting, to the end of harnessing, usually taking place after being stored for a certain period.

The fruit maturation takes place during this period, thus reaching species- and variety-related organoleptic qualities.

Total acidity is considered the sum of all component acids of a product, both the compounds with free carboxyl group, as well as those combined with different cations.

Titratable acidity is determined by the presence of free dissociated acids, acid salts, as well as other compunds with acid reaction (phenols, phosphoric acid) and is expressed in grams or milliequivalents of the predominant acid.

Moreover, no organic acid is entirely predominant (100% of the content).

Free acidity is estimated based on pH values.

When it comes to apples, the expression is made in malic acid, which is found both in the free state and as sodium, calcium, potassium and magnesium, etc salts. Studies show a maximum concentration of malic acid before harvesting (70% of the total of organic acids).

The organic acid distribution in horticultural products is, however, uneven.

Research has shown an approximately 1.6 times higher organic acid concentration in central tissues of the apple and, when pressed, the first portions of juice and less acidic than the ones that follow.

Within the same species, the titratable acidity oscillates within a wide range, depending on the variety of fruits.

Thus, are considered aciditc apple varities those with a higher 0.65g of malic acid/100g of product.

These dynamics are also correlated with the pedoclimatic conditions, as well as storage conditions

Thus, higher acidity was recorded during rainy summers or cold areas.

What is more, each variety has its own dynamics of acidity content. In apples we can see an increase up to a maximum value reached right before harvesting. For this reason, the moment of harvesting has an impact on the evolution of titratable acidity during storage.

For the apples which are earlier harvested, the titratatable acidity steadily decreases, in comparison with the ones later harvested.

Storage conditions greatly influence the acidity and the storage duration of the fruits through the atmospheric parameters.

Thus, the storing of different varieties of apples is done with standardization technologies.

The higher storage temperatures cause a decrease of titratable acidity, also depending on the variety.

The atmospheric composition has a great impact on titratable acidity. A controlled atmosphere partially stops the decrease of acidity by inhibating some enzymes involved in the Krebs cycle (Alina, Ardelean, 2019, Radu, I.F., Gherghi A., 1967 Marca, Gh., 1987, Beceanu, D., 1994, 1998, 2000, 2002, 2003, Ceaușescu, I., Iordăchescu, C., 1987, Gherghi, A., et al., 1981, 1983, 1984,1989, 1994, Burzo, I., et. al., 1984, 1986,. Marca, Gh., 2004, Potec, I., et. al., 1983, 1985).

MATERIAL AND METHOD

Research was conducted in 2019 at the Faculty of Environmental Protection, Oradea.

The Golden Delicious apple, a winter variety, was used for the studies. Harvesting took place in early October.

The fruits have a light colored pulp, crunchy and suitable juiciness and a slightly acidic taste and specific aroma.

Fresh fruits as well as those stored for 3 months were included in the study.

The fruits were sorted and those affected by insects, diseases, wounds, blows etc. were excluded when taken to the cellar.

The apples were placed on a wooden shelf, in a single layer, in natural condiitons. A private cellar was selected for this purpose.

Samples were taken on the harvesting day, collected from fruits on trees located at the edge of the row, as well as from the ones in the middle of the row.

Fruits were sampled from various frames belonging to the same tree, with different exposure to light.

Total titratable acidity was determined by neutralization with an alkaline solution in the presence of phenophthalein 1%.

Titration was performed with 0.1N sodium hydroxide solution.

Results are expressed in malic acid, the predominant acid in apples (Table 1).

Table 1

Malic acid content, at harvest, of apples belonging to the Golden Delicious variety

Sample no.	1	2	3	4	5	6	7	8	9	10	Sampl average
Total titratable acidity (malic acid)g/%	0,2	0,2	0,4	0,3	0,3	0,4	0,4	0,4	0,3	0,4	0,3

Table 2

Malic acid content, during storage, of apples belonging to the Golden Delicious variety

Sample no.	1	2	3	4	5	6	7	8	9	10	Sample average
Total titratable acidity (malic acid)g/%	0,1	0,1	0,2	0,2	0,2	0,2	0,2	0,3	0,1	0,2	0,1

RESULTS AND DISSCUSIONS

The results show that the Golden Delicious variety has a lower content of malic acid when harvested (0.3g), and the total titratable acidity decreases after 3 months of storage to 0.1g/% malic acid.

The relative low content of malic acid at harvest is a matter of variety, the Golden Delicious belonging to the group of varieties with a lower acidity.

Furthemore, reduced precipitations were recorded during the vegetation period, even towards the end of it (September-October), contributing to these results.

The malic acid concent decreased by 33% after 3 months in the storage. This has been atributed to intense metabolic activity in the stored fruits, given the climate factors (temperature, humidity, gas composure) that couldn't be controlled.

Maintaining a proper climate for the storage was done only through ventilating the storage room. Due to these factors, the shelf life of apples was limited to 4 months.

After this period, loss of tissue turgidity was recorded and the fruits were affected by storage diseases, thus sorting and placing them for consumption was imposed.

At the same time, the organoleptic properties and the carbohydrate/acidity ratio were affected.

As a result, the fruits lost the variety-specific harmonic taste.

CONCLUSIONS

The following conclusions can be drawn:

1. Lower acidity recorded at harvest is a variety feature, the Golden Delicious one being a less acidic variety.
2. This relatively low acidity is also due to climatic conditions, the year of production having poor rainfall during summer and autumn and high temperatures.
3. The decrease of malic acid after 3 months of storage is due to the storage conditions. The only way to direct the ambiental factors was ventilation in the absence of air conditioning installations.
4. A more intense metabolisation of organic acids was determined by a significant increase in the respiratory activity of the fruits due to the storage conditions.
5. Under the current circumstances, the storage had to be stopped after 4 months due to the modifications the fruits suffered: changes in tissue turgidity, taste properties, different storage diseases (heart and apical rot) and pathophysiologies (scalding and suberification).
6. Further research is recommended regarding the qualitative changes of apples during the storage period.

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IMPLICATION OF YEASTS IN FOOD TOXINFECTIONS

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Abstract
The frequency of the fungi infections, especially those determined by yeasts, has increased considerably in the last decade. The identification of the species from the pathologic products, and the testing of the susceptivity to antifungal became indispensable in choosing the right therapeutic attitude. Some fungi present both forms of growth and as a consequence they can exist either under the form of yeasts, or under the form of filaments, depending on the temperature. The stage of yeast is formed in the host tissue and in the culture developed at 37°C, and the stage of mold is observed in the cultures developed at temperatures between 25-28°C. These fungi are called dimorphic. But there are still micro-organisms that produce also yeasts and filaments, so that when two forms can co-exist and their appearance is not necessarily determined by the temperature. These fungi are called heteromorphic.

Key words: yeast, filaments, cultures

INTRODUCTION

In the digestive tube of the human being are found currently microscopic fungi from the species *Candida, Trichosporum,Rhodotorula, Turulopsis,Geotrichum,Saccharomyces*, some of them composing the intestinal microbiocenosis together with the aerobe and anaerobe bacteria. Other transitory groups can be of food origin. The proportion of fungi from the stool varies between 28-72%.

The important affecting of the capacities of local, general defense and great ecologic imbalances following some prolonged treatments with antibiotics with wide range can lead to the appearance of some intestinal mycosis. The mycosis diarrhea syndrome is characterized by stools of reduced consistency, even watery, accompanied by a fever or sub fever condition and digestive symptomatology consisting of burns and diffuse abdominal pain, inappetence and sometimes nausea.

The lack of tests of pathogenicity and of a specific pathology, make the etiologic involvement to be difficult, especially in the case of the species of *Candida*, *C.albicans, C.tropicalis, C.krusei.*

In the presence of a chronic digestive symptomatology, the dominance of the fungal elements in the pathologic product includes the micrologic investigation of the stool is performed in two steps: the direct microscopic examination and the collecting.

Therefore it was performed the direct microscopy that is essential, consisting of smears fixed and gram colored. Following the accomplishing of smears was discovered the presence of the yeasts in large quantity and their" dominance" by comparing to the fecaloid bacterial flora diminished sometimes until the disappearance.

MATERIAL AND METHODS

We accomplished a prospective study, based on the microbiologic diagnosis registered in the bacteriological register of the laboratory of medical analysis, S.C. Diaser, Oradea.

The duration for which was extended the study is of 5 years, included in the period 01.01.2014-31.12.2019.

For the performing of the study was used also the archive, registered in the specific program of the computer from the laboratory of S.C. Diaser, Oradea, the computerized data base of the unit, respectively.

Necessary materials for the performing of the examination:
■ A recipient of collection (collection recipient of fecal matter with collecting spoon) with transport medium
■ Wood spatula
■ Latex gloves

For the collection of fecal matter it has to be collected a sample of fecal matter of 5-10g introduced in the collection recipient of fecal matter with transport medium. If the stool is liquid, it will be collected 5 ml. It is recommended to be chosen a liquid, mucous and bloody portion, if there is one.

RESULTS AND DISCUSSIONS

The microscopic aspect is decisive for the collecting of the stool in order to isolate and quantify the yeasts. Always colored intensely gram-positive, depending on the taxonomic group they cover different forms, of spherical or oval yeasts disposed in crowds or moniliform chains often branched. The disposition and morphology suggests the species, for this reason the microscopy of the sample and afterwards of the isolated is essential in the mycological examination.

The isolation of the yeasts was made by cultivation on agar mediums that contain inhibitors for bacteria. The stages predecessor to the cultivation are identical to those for the bacteriological investigation, with the mention

that the collection is made always from the stool made spontaneously. Although there were visualized many mediums, in the literature there are only a few specifications in relation to the fungi from the fecal matters.

The Sabouraud CCG medium is highly selective allowing only the development of *C.albicans.* The Sabouraud DC version is less inhibiting, allowing also the development of other yeasts, so it has a wider application.

In order to incriminate the mycotic etiology in a diarrheic syndrome it is necessary for a quantitative examination of the yeasts, respectively the determination of the number of units that form mycotic colonies (UFC)/g or ml of fecal matters and the identification of the respective yeasts.

From the initial suspension of fecal matters, in isolated saline solution, are made dilutions 10^{-2} și 10^{-3} (respectively 10^{-3} și 10^{-4} of product) of which, one by one 0,2 ml is seeded on a plate of Sabouraud DC by flooding. Also from the initial suspension are made dispersions with the loop on Sobouraud CCG.

The preliminary identification is based on the characteristics of the colonies and the microscopic nature (form, dimension, presence of capsule).
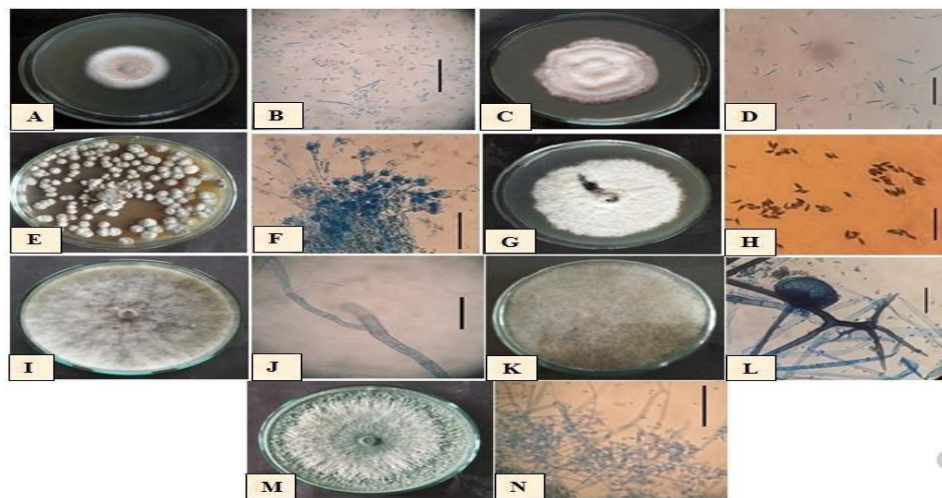
Figure 1. Flat colonies, Conidiophores and conidiasof*Fusarium moniliforme* (A-B), *Fusarium sporotrichioides (*C-D), *Penicillium sp.* (E-F), *Pestalotiopsis guepinii* (G-H); Flat colonies and sterile mycelia of*Rhizoctonia solani* (I-J), Flat colonies ,, *Sporangium* with sporangiospores of*Rhizopus stolonifer* (K-L) and*Trichoderma viride* (M-N).
www.researchgate.net
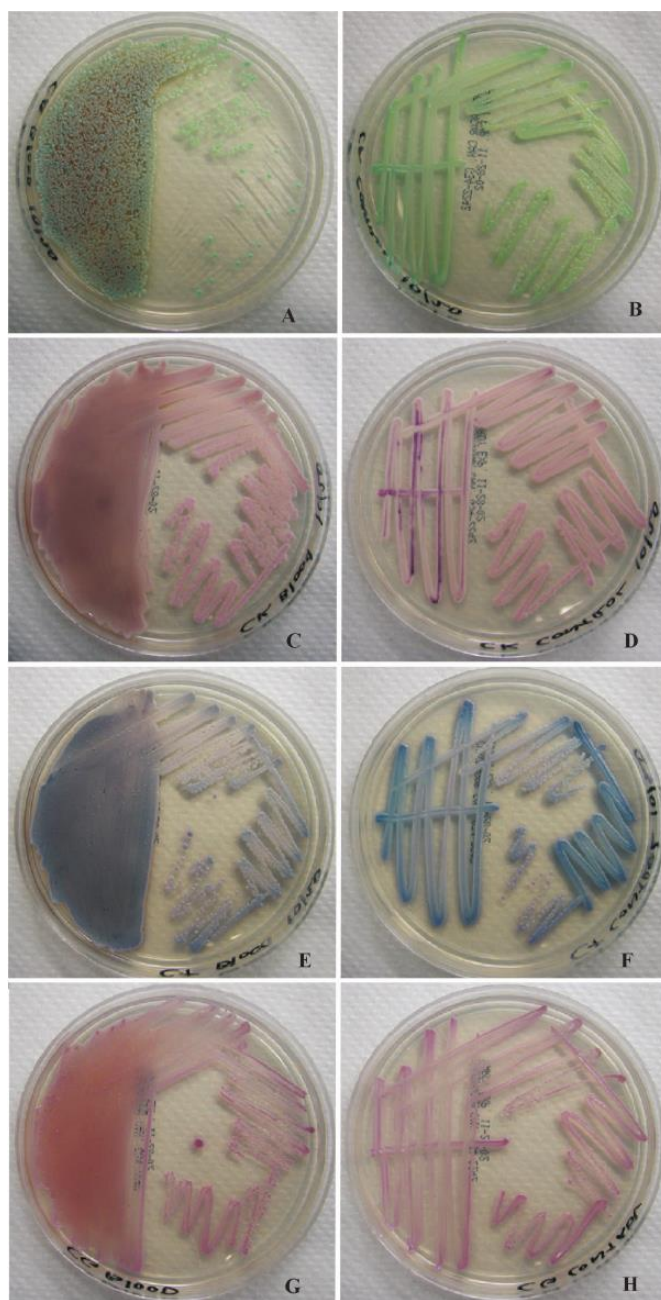
Figure 2. Colonii de *C. albicans* (A and B), *C. krusei* (C and D), *C. tropicalis* (E and F), and *C. glabrata* (G and H), mediul de cultură CHROM – agar
www.researchgate.net

The study regarding the "Immobilization of the filamentous fungi. A new frontier in the production of organic acids" highlight some fungal metabolites, primary or secondary, and also enzymes and other products of

biotransformation of fungal origin, that play a strategic role in many technologies and especially in the processing of the food. Among these, the organic acids seem to be of major interest. The citric acid is already produced in more than 3 tons/ year and the market demand for other acids, as gluconic, lactic and malic acids is in continuous increase. This review is dedicated mainly to the most recent progresses in the production of organic acids from the systems of immobilized fungal cells. The production of fumaric acid by immobilized *Rhizopus* arrhizus is reported as study of case. In fact, the fermentative production of this acid, that was for many years abandoned for economic reasons and replaced with the direct chemical synthesis, could benefit in a great measure from the utilization of a technology based on immobilized cells.

CONCLUSIONS

*Candida albicans*holds the major role in the mycotic etiology of the diarrheic. The presence especially in the immunodeficiency, represents one of the frequent undercurrent infections in AIDS. The aspects of cultivability of *C. albicans*are characteristic on agar Sabouraud CCG, being the only yeast that develops in such a degree of selectivity.

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LEGAL REGULATIONS REGARDING TRADITIONAL PRODUCTS

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Abstract
Food safety and consumer protection is a subject that is of interest to both the consumer and the producer, whether they are professionals or non-professionals, as well as to specialists in the field.
The issue of consumer protection concerns aspects related to the system of relations created in the market, generated by the confrontation of consumption with the product offered by the producer, to which is added the framework for the development of the relations between the offerors and the consumer.
This paper has as its main objective the analysis the legal regulations that refer to traditional products and their labeling.

Key words: traditional products, food products, labeling, specific legislation

INTRODUCTION

In the context of the expansion of the traditional productsmarket, the authorities felt the need to renew the legislation in the field, which would allow a clearer identification of traditional products.[1]

The traditional product is a food product for which local raw materials are used, it does not have food additives in its composition, it presents a traditional recipe, a traditional production and processing method and which differs from other similar products belonging to the same category;

Traditionality is the element or set of elements by which a product is distinguished from other similar products belonging to the same category.It may not be limited to a qualitative or quantitative composition or to a mode of production established by Community or national rules or by voluntary standards.

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[1]https://www.juridice.ro/297544/traditional-handmade-bio-trendul-alimentelor-pe-piata-romaneasca-ce-trebuie-sa-faci-ca-sa-poti-opera-pe-piata-produselor-traditionale.html

MATERIAL AND METHOD

The materials used in writing this paper consist of normative acts and web pages.The methods used are legal, namely the formal method, the historical method, the comparative method, the logical and analytical method.

The use of these methods had the role of performing a systematic analysis of the information from the studied sources in order to elaborate the points of view and the conclusions.

RESULTS AND DISCUSSION

[2]The dynamics of food consumption strongly integrate products of several types, natural, ecological, traditional or local.The identification and representation that a consumer has about a place or a method of production may appear to him as the demonstration of an authentic product.These elements and others in the production sector lead to the development of labeling practices which, in different forms, aim to provide the consumer with a guarantee, to authenticate the existence of a link between the product and the place of origin, to protect this product from possible counterfeiting.Thus, local food seems to have a greater value as an indicator for local and traditional cultural identity, than as a marketing label.

Given the great diversity of food products and the abundance of information available, consumers want to have clear and concise data on the origin of products, their specific characteristics due to geographical areas, provenance and traditional production methods, history, giving them the opportunity to make the best choice.

The certification of food products is carried out in accordance with the European and national legislation in force and European standards. DO - "Designation of Origin": can be the name of a region, a specific place or a country, used to describe an agricultural or food product.

The product must be: originating in this region, specific place or country. The characteristics of the product are due to the geographical environment of origin with its natural and human factors.

The raw materials used must come only from the defined geographical area, and production, processing and preparation must take place only in that geographical area. PGI - "Geographical Indication": can

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[2]https://gastroart.ro/2017/04/17/produsele-traditionale-abordari-teoretice-perceptii-si-reglementari/

be the name of a region, a specific place or a country, used to describe an agricultural product or food.

The product must be: originating in this region, specific place or country and have a specific quality, reputation or other characteristics attributed to that geographical origin.

The raw materials used can also come from outside the defined geographical area; certain operations of the production process, such as: packaging, freezing, storage, may take place outside the defined geographical area. GTS - "Guaranteed Traditional Specialty": the product results from a production, processing or composition process that corresponds to a traditional practice and is produced from raw materials or ingredients used in the traditional way.

The certification of food products is intended to protect against: any commercial use of a registered naming which would allow the exploitation of its reputation; misuse, imitation or evocation of origin; any false or misleading indication regarding the provenance, origin, nature or essential qualities of the product; any other practice susceptible to mislead the consumer as to the true origin of the product.[3]

The European Commission has adopted a number of regulations on the application of EU quality systems to the agricultural and food sector. Covering the wider context of quality systems for this sector, including geographical indications andguaranteed traditional specialties, the legislation also explains how the use of logos in relation to each system, how the programs should be applied, referring also to the guidelines regarding the labeling of agri-food products using DO (designation of origin) and PGI (protection of geographical indications) ingredients.[4]

[5]The attestation of the traditional products represents the recognition of the traditionality of a product through its registration and the issuance of the document "Certified traditional product" with the observance of the following conditions:

- local raw material - the raw material used to obtain the traditional product and which is produced in the territory of the state where the traditional product is manufactured

- traditional product certificate - a document certifying that the holder meets the legal conditions for the production /manufacturing/ processing of local raw material in order to obtain a traditional product

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[3]https://www.certind.ro/conformitate-produse_18/produse-alimentare-dop-si-igp_20
[4]https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/quality-schemes-explained/regulations-food-and-agricultural-products_ro
[5]Order 1082/2013 on the attestation of traditional products, published in the Official Gazette. 688 of 11/11/2013

To be certified as a traditional product, the product must meet the requirements of the *task book*. The task book must contain the following elements: the name of the product.If the product is already registered under a custom, unique name, it is not registered again;description of the characteristics of the traditional product, indicating the main organoleptic properties: color, taste, odor, aroma, consistency, appearance, physico-chemical: moisture, protein content, fat, carbohydrates, salt, pH, porosity and microbiological, as appropriate,to define its traditionality / specificity; description of the characteristics of the raw materials, which do not contain in their composition additives obtained by chemical synthesis and not only, such as: food additives, flavors, vitamins, minerals;the origin of the raw materials; description of the characteristics of the ingredients used in the manufacturing process, which to not contain in their composition food additives, except for natural additives, respectively dyes, flavors, vitamins, minerals, sweeteners;indication of the ingredients used and of the main organoleptic, physico-chemical and microbiological properties, where applicable, of them; description of the specific local, authentic and invariable production method, as well as the description of the traditional technological process,where all the production phases will take place, specifying the operations executed manually; description of the specific elements regarding the packaging, in order to ensure the quality, origin and identification elements, respectively the material from which the packaging is made, its properties and its influence on the finished product; photo and product description per section,where appropriate, representing the specific characteristics of the product, the shape; the mode of production and / or processing which reflects a traditional technological process of production and / or processing by which the product is distinguished from other similar products belonging to the same category;minimum requirements and procedures for verification and control of product traditionality; production capacity achieved - reported for one year, respectively 365 days, which may not exceed the average quantity of 150 kg / liter per day total certified traditional product and not more than 400 kg / liter per day total certified traditional products,except for the production of traditional bread and bakery products - which may not exceed the average quantity of 300 kg per day total certified traditional product and not more than 800 kg per day total certified traditional products;data, documents, bibliographic references that indicate the historical origin of the product, to demonstrate the transmission of a tradition from one generation to another and from which to result the historical connection of the traditional product with the place of productionor a statement of notoriety from a local association of producers of traditional products signed by its governing bodies.

In the context of declaring some products as traditional, the specific legislation on food labeling must also be taken into account.Decision 106/2002 on food labeling published in the Official Gazette. 147 of 2002.02.27 and the Methodological Norms of 2002 regarding the labeling of foods published in the Official Gazette. 147 of 27.02.2002 regulates the labeling of food delivered as such to the final consumer, as well as restaurants, hospitals, canteens and other economic agents that prepare and supply food for the population.[6]

CONCLUSIONS

The regulations regarding the attestation of traditional products create a rather rigorous procedural framework, the rules thus becoming stricter, the regulations are more detailed.Producers and consumers thus have clearer marks about what traditional products are and how they are identified.

By declaring a product as traditional, we are facing a transformation of it into a heritage object that is transmitted from generation to generation and gives a special shade to the geographical area of which it is part, thus becoming a product with a special value, being linked the tradition, specificity and identity of the area from which it comes.

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[6]Decision 106/2002 on food labeling, Methodological Norms of 2002 on food labeling

POLITICAL AND LEGAL CONDITIONALITIES FOR THE COHESION POLICY AND CAP POST-2020. BETWEEN REAL ISSUES AND UNJUSTIFIED FEARS.

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Abstract
The negotiating process for the new Multiannual Financial Framework of the European Union post-2020 has been so far a complicated process where the technical issues have become entangled with the political aspects related to a new series of conditionalities. This has open a 'Pandora's box' at the level of the Member States as regards their relationships between the New and Old Europe and Member States and the European Union institutions.

Key words: political conditionalities; CAP; cohesion policy

INTRODUCTION

Agricultural performance as well as the larger objective of the European Union convergence can only be achieved when the financing from the European Union level matches the level of ambition and the challenges that lay ahead of the Member States and interested parties. In these authors opinion the starting point of any discussion concerning future conditionalities should start from the basic documents that represent the foundation of our Union.

As the European Union is based on the rule of law any action taken at the community level needs to have its fundament in the Treaties and must not be imposed on a compulsory and not democratically basis to the member countries.

For that purposes any analysis of the cohesion policy and of CAP should have as a guiding red line the fact that the European Union "shall promote economic, social and territorial cohesion, and solidarity among Member States", "shall combat social exclusion and discrimination" and last

but not least "shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment" (Consolidated version of the Treaty on European Union)

MATERIAL AND METHOD

The methods used for the elaboration of the paper were based mostly on the desk research approach and literature review. Given the vastity of the topic and the technical limitations of this article the authors have proceeded to the analysis of the information concerning the topic as it results from the official documents and analysis of the European and national institutionsThis particular attention is of relevance as the topic analysed is a fluid one, with changes that happens due to the rather political than technical aspect of conditionalities that are being discussed.

Another important topic that the authors provided attention was providing the necessary terminological clarifications that such an endeavour require. We strongly believe that providing those methodological and terminological clarifications would further strengthen the debate and provide the necessary common ground for any comparative analysis.

RESULTS AND DISCUSSION

As mentioned above in the section about Materials and methods the first thing that this papers intends to do is to clarify the key concepts at stake in this process. So, first and above all what is the Multiannual Financial Framework (MFF) and what role it plays?

"The MFF (Multiannual Financial Framework) is the **EU's long-term budget** and usually covers a seven-year-period.
It is primarily an **investment budget**, pools resources to implement policies and brings an added value to the benefit of all EU citizens by delivering on common challenges such as fighting climate change and environment protection, digital challenges, defence and border security, social rights and jobs." (European Parliament, 2020).

A concise reading about the importance of the MFF is provided in an analysis dedicated to the MFF and the position of Romania post-2020 were the authors synthetised for the national audience the purpose and relevance of the MFF in order to have a clear meaning.

Thus everyone would have a definite vision on what is and why does it matter both at the European level but mostly at the national level, as the role and purpose of the MFF if properly understood would represent the bedrock of any future negotiation and of any future debate on why do we

need to get involved and what we can expect and what can we demand from the other partners as shown in Table 1 below (Dăianu et al. 2018).

The purpose of the MFF

align EU spending with its political priorities	translates the political priorities of the European Commission (EC) into the financial terms and into the programs and projects to be implemented for a minimum of five to seven years; the MFF plans how much the EU can spend, so there must be no confusion made between the MFF and the EU's annual budget;
ensure EU budgetary discipline	sets maximum annual ceilings for EU total expenditure and expenditure categories/priorities (limits) to ensure that there is adequate funding for the whole financial programming cycle
make adoption of the annual EU budget easier	ensures discipline in distributing funds according to medium and short-term priorities
add predictability to EU finances	provides a degree of predictability for European funds beneficiaries with regard to project funding

Source: Daianu et al, 2018

What about the conditionalities? Each time the financial allocations for cohesion policy and CAP came with a series of so-called "conditionalities" meant to guarantee the proper use of the EU funds. Thus "conditionality is an established EU governance tool. It represents in essence a requirement that all EU spending comply with a set of Union policy standards subject to withdrawal of funds in case of failure to do so." (Viţă, 2018, p 15).

The idea to condition access to external funding is to facilitate the realisation of several objectives such as:

➢ **Induce a desired behaviour** (e.g. take more environmentally friendly options to reach objectives of the CAP)

➢ **Reduce moral hazard** (to ensure that funds are deployed where they are needed and not elsewhere)

➢ **Provide a framework to deliver on mutually desired objectives** (in order to ensure a level of collaboration and communication between multiple actors involved)

➢ **Protect the donor from political shifts on the recipient's side** (Ferrer et al, 2018, p. 6)

The conditionality has an intrinsic policy objective that differs from the immediate objective of the EU spending. For instance a conditionality that would require that all the new farms respect the EU environmental standards would see that the primary objective of the CAP policy (creation of new farms) differs from the conditionality (environment standards and protection) (Viţă, 2018).

The practice of conditionality applied to political and economic relationships is not something new on the international arena. It has been practiced mostly on economic affairs, by institutions such as the World Bank or the International Monetary Fund.

"Policy-based conditionality—or simply conditionality—linking the release of funds to the implementation of a desired action or policy is a central element in the aid relationship between international financial institutions (IFIs) and recipient countries."(World Bank, 2005)

Many of these conditionalities where policy-based and where meant to promote a pro-market agenda, often with debatable results, as shown in Table 2 below.

Table 2

Policy-related conditionalities of the IMF, World Bank and USAID

WASHINGTON CONSENSUS	• Policy-based conditionality carried out by the IMF, World Bank and US Treasury in developing countries in the 1980s and 1990s • Funds linked to pro-growth reforms, trade openness, liberalisation and fiscal discipline • Very modest results plus side effects: destabilisation, the Argentinian crisis, anti-Americanism • Since 2000, a new approach considering **ownership** to be crucial for compliance, implementation and long-term stability
MILLENNIUM CHALLENGE CORPORATION	• Innovative agency for bilateral development assistance created by US Congress in 2004 • Limited funds awarded through a competitive selection based on 17 politics free indicators • Eligibility criteria are based on the rule of law, rights protection, ease of doing business, regulatory quality and anticorruption measures • Country-led solutions and projects but independent monitoring and evaluation

Source: Ferrer et al, 2018, p. 9

The main idea behind the conditionality is to provide to the citizens the necessary guarantees that their life would be improved by the national governments who receive the money.

Other the economic perspectives other researchers have emphasized the constitutional grounds for conditionality especially in federal systems as conditionality:

•conditionality assists the higher level of government to exercise its right but also its obligation to set appropriate requirements, which ensure that all spending is compliant with **federal standards**;

•conditionality is conductive to harmonious development of **minimum standards** of public goods and service delivery across the federation;

•conditionality leads to closer **federal-state cooperation** and coordination of essential multi-level policies;

•conditionality may support **effective government** and solve collective action;

•conditionality may ensure much needed **uniformity and consistent application** of federal standards in a multi-level government, helping states embrace imminent policy solutions in an ever-closer and deeper Union;

•conditionality is **federation-building** and **solidarity-enhancing** and may ultimately **empower citizenry**. (Vita, 2018, p. 17)

Correlation with good governance

The question of correlating fund efficiency with good economic governance is a recurrent topic at the UE level as many official documents tend to speak about the need to correlate fund efficiency with sound economic governance. The main idea is to review and propose amendments to relevant Operational Programmes / Partnership Agreements at the request of the European Council and to implement the relevant recommendations issued. This adjustment is no longer optional as sanctions are being put in place – such as suspension of all or part of the commitments or payments for the programmes in question (Proposal for a Regulation, 2018, art. 15).

This would be adjusted in a Report of the European Parliament of 2019 related to the above mentioned document, where the European Parliament suggested the deletion of the article related to the correlation between funds and good economic governance. Thus in the Opinion of the Committee on Agricultural and Rural Development the Amendment 8 proposed no more no less than the deletion of the text proposed by the Commission that stipulated "(20) Mechanisms to ensure a link between Union funding policies and the economic governance of the Union should be further refined, allowing the Commission to make a proposal to the Council to suspend all or part of the commitments for one or more of the programmes of the Member State concerned where that Member State fails to take effective action in the context of the economic governance process. […]" (Report of the European Parliament, 2019)

However the European Council of 17-21 July 2020 ignored this opposition and in its Conclusions supported these policy conditionalities, meant to link the founds to sound economic governance: "Mechanisms to ensure a link between Union funding policies and the economic governance of the Union should be maintained, allowing the Commission to request a review or amendments to relevant programmes in order to support implementation of the relevant Council recommendations or maximise growth and

competitiveness impact of the Funds; or make a proposal to the Council to suspend all or part of the commitments or payments for one or more of the programmes of the Member State concerned where that Member State fails to take effective action in the context of the economic governance process." (European Council, Conclusions 17 – 21 July 2020).

This can be perceived as another advancement as regards the hot topic of conditionalities, especially those related with the compliance with the principles of the rule of law. This ambiguity lasted for a couple of months as no later than in September 2020 did the Council of the European Union reached an agreement on the mandate for interinstitutional negotiations on the rules necessary for the protection of the Union budget in the case of breaches of the principles of the rule of law in the Member States, by providing the key definitions, the conditions for the adoption of measures, the content of measures, the procedure to be followed and the and way to lift of measures. (Council of the European Union, 2020)

Following this breakthrough only on 5 November this year the European Parliament reached a provisional agreement with the Council presidency **which would make it possible to stop payments from the EU budget to member states that do not respect the rule of law.**

Long story short the main lines of this provisional agreement stipulate the following:

  ➢ **A broader concept of breaches of the rule of law** (by listing examples of cases, such as threatening the independence of the judiciary, failing to correct arbitrary/unlawful decisions, and limiting legal remedies .)

  ➢ **Prevention** (it can be triggered when there is a serious risk that it may do so)

  ➢ **Functioning of the mechanism** (shortening the time that the EU institutions will have for the adoption of measures against a member state, if risks of breaches of the rule of law are identified, to a maximum of 7-9 months).

CONCLUSIONS

The topic of conditionalities remains on the European and national agenda, often in a contradictory position as there is a risk of politicisation of the conditionalities. As seen above the issue of conditionalities is not something to be treated lightly as it can have a great impact of the beneficiaries. For instance you have a great project, with all the technical

aspects clear and have your funding reduce due to national issues above your paygrade or control.

The question of conditionalities needs also not to be interpreted as an "attack" against the farmers but rather as an incentive to perform better and to have a good governance. It needs to generate a more holistic approach as regards the EU funds and the national authorities as the funds do not come as a "gift" but rather they must be seen as an incentive to better performance and management.

Also the current debate has seen the rise of the European Parliament in a more prominent role in debate, especially in the case of rule of law conditionality. This is yet not a new thing as some scientist foresaw it in context of the debate for the post-2020 MFF and its related conditionalities. The EP was meant to have this increase role as an increased number of conditionalities would require both its involvement and that of the European Commission. "A stronger involvement of the EP would reduce the criticism that conditionality has no 'democratic' basis. Nevertheless, there may also be a danger that conditionality and EU re-distributive policies could become more politicised and, finally, neglect the fundamental elements and treaty objectives of territorial, economic and social Cohesion Policy, however it would contribute to a broader transparency in the decision-making and legitimation of sanctions." (Kölling, 2017, p. 7)

That must serve as a reminder to the need to have a continuous monitoring of the debate at EU level and also a constant attention addressed toward the authors and experts on this field, as for instance, the above mentioned 2017 research announced this year stronger involvement of the European Parliament and thus further measures could have been taken in order to be an active part of the debate.

This augmented involvement is also need for issues such as the current COVID-19 pandemic which affected the MFF in ways that were not envisaged a half a year ago. Thus been actively involved in the debate might be one of the ways to steer the discussion toward a more favourable outcome for the agricultural sector at the national level.

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CONSIDERATIONS RELATING TO THE CULTIVATION OF PLUMS IN THE NORTH-WEST DEVELOPMENT REGION, ROMANIA

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Abstract
The paper analyzes the areas cultivated with plums worldwide, in the European Union and in Romania, in the period 2018-2019. Also, the number of cultivated plums and the production obtained at national level are presented, on Macroregions and Development Regions, as well as at the level of the counties that make up the North-West Development Region, for the year 2019. In this Region, plums were the second option for fruit growers, representing 36.56% of the total number of fruit trees, and the production obtained - 41.59%. The North-West region stood out, in fact, due to the average production of plums - 24 kg / tree, which in 2019 exceeded the national average (20 kg / tree). Of the 6 component counties, Sălaj county had the most plums - 31.18% and the highest plum production - 34.26% and an average production - 27 kg plums / tree. The forms of ownership in which the largest share of plums and plum production were found were individual holdings.

Key words: plum production, plums, North-West Development Region, Romania

INTRODUCTION

The tradition and preferences of Romanians regarding the growth of plums and the processing of plums have positioned our country among the major growers and producers worldwide. In Romania, this fruit species was the first choice for fruit tree growers in the period 2008-2017, so that the plums occupied the largest areas, followed by apple trees *(MADR)*.

Romania was, in 2019, the 2nd largest plum producer in the world, with a production of 692,670 tons, which represented 47.38% of the total fruit production of the country. Out of the total of 73,866,869 fruit trees existing in 2019 in Romania, 46.65% were plums. Macroregion Four is the "homeland of plums", here being cultivated in 2019 - 40% of the total

plums and harvesting 37% of the total production*(NIS)*. Plums are appreciated due to their content in vitamins (A, C, B1, B2, B3, B6, K, E and folic acid), minerals (K, P,Mg, Fe, Ca and Zn), fibers, carbohydrates and others, and low calories. They are used both fresh and dried, in the preparation of pies, desserts, jams and jellies (*Ghidnutritie.ro*). Last but not least, it is the raw material for the production of traditional alcoholic beverages. In the current financial year, 2014-2020, PNDR supported the development of fruit growing by creating sub-measures dedicated to this sector, which aimed at setting up new plantations, filling gaps with saplings, reconversion, purchasing equipment, setting up / modernizing storage or processing systems*(AFIR, PNDR 2014-2020)*.

MATERIALS AND METHODS

In this paper, a series of indicators were analyzed, such as: the area cultivated with plums (ha) and the production of plums (tons) worldwide, by Union (EU) and national, total by country and by Macroregions, Development regions and counties. The number of plums and the average plum production (kg/tree) for Romania, by Macroregions, Development Regions and counties were also studied. The information was processed, interpreted and presented in the form of graphs and tables. The data presented in the paper were taken from the Internet, after extensive documentation carried out on specialized sites such as Eurostat, Faostat and NIS.

RESULTS AND DISCUSSIONS

According to data published by Faostat, in 2018 Romania was on the 4th place in the world ranking of plum growers, with an area of 65,910 ha (Table 1). The first place was occupied by China, where 1,925,399 ha of plums were cultivated. In terms of plum production, Romania ranked second, with 842,132 tons, after China - 6,801,187 tons.

Table 1

The world's leading growers and producers of plums, 2018

Specification	Area ha	Production tons
China	**1,925,399**	**6,801,187**
Bosnia and Herzegovina	**97,739**	190,386
Serbia	**72,224**	**430,199**
Romania	65,910	**842,132**
Iran	41,834	313,103

Source: Faostat, 2020

The area cultivated with plums in the European Union was 155.08 thousand ha, in 2019, increasing by 0.19% compared to 2015 (Table 2). In Romania, the largest plum grower, the area decreased by 0.14%, from 65.67 ha in 2015, to 65.58 ha in 2019. In 2017, our country registered the largest area occupied with these fruit trees, of 66.68 thousand ha.

Other large plum growers in the EU were in 2019 Spain - 14.85 thousand ha, France - 14.83 thousand ha and Poland - 13.63 thousand ha.

Table 2

The main plum growers in the EU -28, (1,000 ha)

Specification	2015	2016	2017	2018	2019	2019/2015 %
European Union - 28	154.79	153.49	154.48	154.05	155.08	100.19
Bulgaria	6.83	6.71	6.82	7.36	8.02	117.42
Czechia	1.87	1.88	1.76	1.82	1.88	100.53
Germany	4.34	4.35	4.83	4.82	4.83	111.29
Greece	2.05	2.60	2.06	2.20	2.18	106.34
Spain	16.06	15.28	15.20	14.64	14.85	92.47
France	14.97	14.81	15.06	14.97	14.83	99.06
Croatia	5.12	4.83	4.36	4.28	4.46	87.11
Italy	11.63	11.57	11.68	11.72	11.94	102.67
Cyprus	0.58	0.45	0.38	0.37	0.38	65.52
Lithuania	0.77	0.73	0.73	0.72	0.74	96.10
Hungary	7.22	7.98	7.94	7.92	7.96	110.25
Poland	13.90	13.39	13.31	13.48	13.63	98.06
Portugal	1.79	1.80	1.78	1.80	1.80	100.56
Romania	*65.67*	*65.11*	*66.68*	*65.91*	*65.58*	*99.86*
Slovakia	0.56	0.58	0.52	0.61	0.61	108.93
United Kingdom	0.70	0.70	0.60	0.62	0.60	85.72

Source: Own calculation based on Eurostat, 2020

Out of the total of 73,866,869 fruit trees that were cultivated in 2019 in Romania, 46.65% were plums, 34,459,654. The distribution by Macroregions and Development Regions is shown in Figure 1. As it can be seen, Macroregion One registered the highest percentage, here being found 40% of the total plum specimens in Romania. Macroregion One and Three recorded the same percentage, of 21% of the total plums, and Macroregion Two 18%.

The development regions where over 5,000,000 plums were grown in 2019 were South - West Oltenia Region - 8,645,560 plums (representing

62% of the total of Macroregion Four), South Muntenia Region - 7,199,087 plums (representing 98% of the total of Macroregion Three), North - West Region - 5,352,453 plums (representing 75% of the total of Macroregion One) and West Region - 5,253,880 plums (representing 38% of the total of Macroregion Four). The Bucharest-Ilfov region, where agriculture and fruit growing is not an important activity, has only 125,654 plums, 2% of the total of the Macroregion Three.
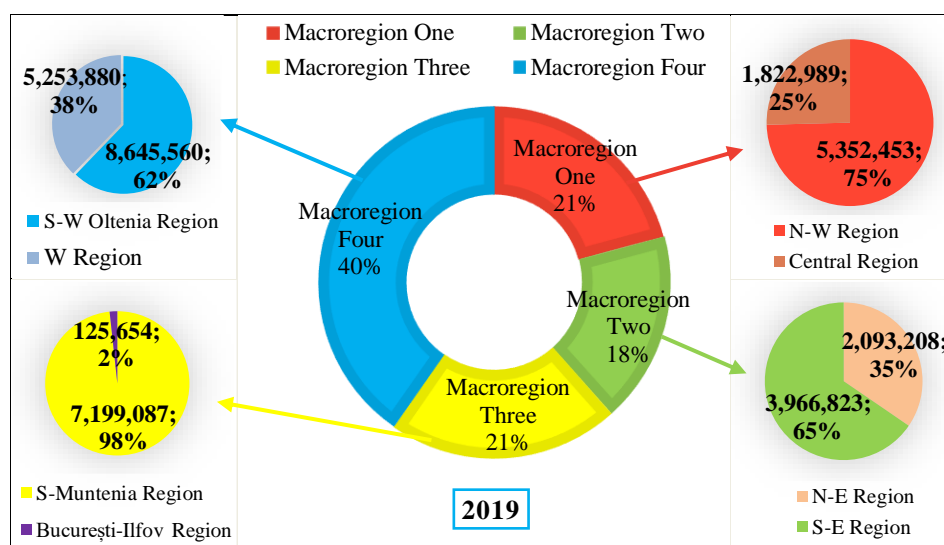
Figure 1. Number of plums by Macroregions and Development Regions, 2019
Source: Own graphics based on NIS, Tempo On-line Database, 2020

In the North-West Region, the plums cultivated in 2019 represented 36.56% of the total registered fruit trees - 14,639,327. This Region is known for the fact that most apples in the country were cultivated here (*Soare E., Chiurciu IA, 2018*).

The distribution of plums on the counties of the Development Region is shown in Figure 2.

From the presented data it is observed that Sălaj county owned the most specimens - 1,668,719, ie 31.18%, followed by Satu-Mare - 1,151,187, representing 21.51% and Bihor - 733,915, 13.71%. The lowest number of plums was found in Cluj County - 523,281, ie 9.78%. Taking into account the forms of ownership, in the North-West Region 99.63% (5,332,599) of the plum specimens were owned by the private sector, of which 5,099,782 specimens by individual holdings, ie 95.63%.
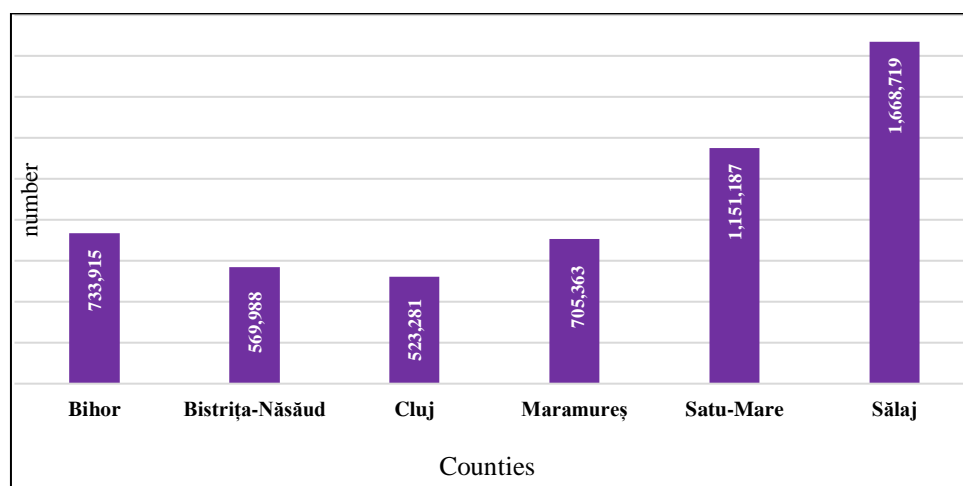
Figure 2. Number of plums in the counties of the North-West Region, 2019
Source: Own graphics based on NIS, Tempo On-line Database, 2020

Regarding the plum production obtained in the period 2015-2019, in the EU (Table 3), we find an increase of 16.39% in 2019 compared to 2015. Romania, the largest plum producer, recorded an increase of 42.60%, from 485.74 thousand tons in 2015 to 692.67 thousand tons in 2019. 2018 was the year in which the largest production of plums in the analyzed period was obtained, by 842.13 tons.

Other important plum producers were, in 2019, Italy - 215.02 thousand tons, France - 205.11 thousand tons and Spain - 179.84 tons.

Table 3

Plum production obtained by the main EU growers -28,
(1,000 tons)

Specification	2015	2016	2017	2018	2019	2019/2015 %
European Union - 28	1,399.56	1,472.01	1,297.25	1,772.37	1,628.98	116.39
Bulgaria	36.18	48.63	49.19	56.43	56.19	155.31
Czechia	9.12	6.00	4.07	12.92	8.76	96.05
Germany	51.43	42.06	26.59	70.12	52.14	101.38
Greece	22.24	23.78	25.46	28.79	20.54	92.36
Spain	217.29	193.60	172.33	152.98	179.84	82.76
France	163.01	216.43	211.03	175.44	205.11	125.83
Croatia	9.07	8.84	7.84	12.54	9.06	99.89
Italy	199.94	220.73	206.97	197.73	215.02	107.54
Cyprus	1.73	1.18	1.63	1.19	1.21	69.94
Hungary	46.02	47.56	43.30	46.69	45.25	98.33
Austria	16.74	7.78	9.72	29.56	12.78	76.34

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Poland	94.90	109.50	58.40	121.08	94.95	100.05
Specification	2015	2016	2017	2018	2019	2019/2015 %
Portugal	24.54	26.07	29.52	17.48	17.48	71.23
Romania	*485.74*	*502.20*	*434.39*	*842.13*	*692.67*	*142.60*
Slovakia	2.20	0.49	0.99	2.19	1.79	81.36
United Kingdom	11.00	9.20	8.00	8.70	7.40	67.27

Source: Own calculation based on NIS, Tempo On-line Database, 2020

Of the total fruit production of Romania in 2019, of 1,487,450 tons, the plum production represented 47.38%. Figure 3 shows the distribution of the plum crop by Macroregions and Development Regions. Thus, it is found that in Macroregion Four the highest quantity was obtained, totaling 37% of the plum production, unlike Macroregion Three, which ranked last with 19%. Production in Macroregion One represented 24%, and that in Macroregion Two - 20%.
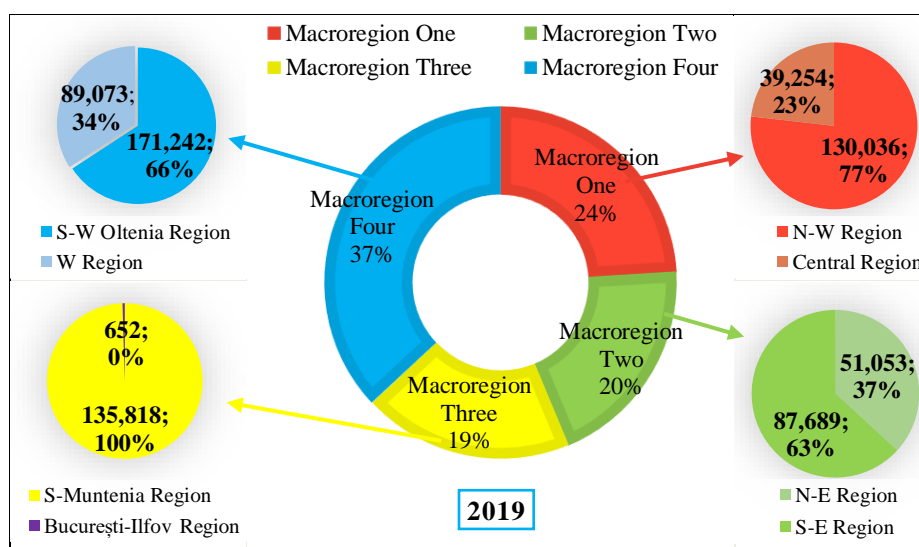
Figure 3. Plum production (tons) by Macroregions and Development Regions, 2019
Source: Own graphics based on NIS, Tempo On-line Database, 2020

The development regions where the largest plum crops were obtained in 2019 were South - West Oltenia Region - 171,242 tons (representing 66% of the total of the Four Macroregion), South Muntenia Region - 135,818 tons (representing 100% of the total of the Macroregion Three) and North - West Region - 130,036 tons (representing 77% of the total of Macroregion One). In the other Development Regions, the plum production obtained was below 100,000 tons.

For the North-West Development Region, plum production - 130,036 tons, represented 41.59% of the total fruit production obtained in 2019, of 312,631 tons.

Figure 4 shows the plum harvests that took place in the 6 counties of the North-West Development Region. The first three places were occupied by Sălaj counties - 44,547 tons (34.26%), Satu-Mare - 29,064 tons (22.35%) and Maramureș - 17,162 tons (13.20%). In Bistrița-Năsăud County, the lowest plum production was obtained - 11,397 tons (8.76%). Application of the Expert system in the plum plantation from SCDP Bistrița, BistrițaNăsăud county, showed that the natural and anthropic resources include the plantation in the category "with natural and anthropic restrictions".Analyzing the climatic conditions, it is found that in the Bistrita area there are average conditions for plum cultivation, with restrictions on average temperatures recorded in May, thermal amplitude recorded in November-February and rainfall recorded in May-July (*Dana D. et al., 2020*). All this negatively influenced the production of plums.
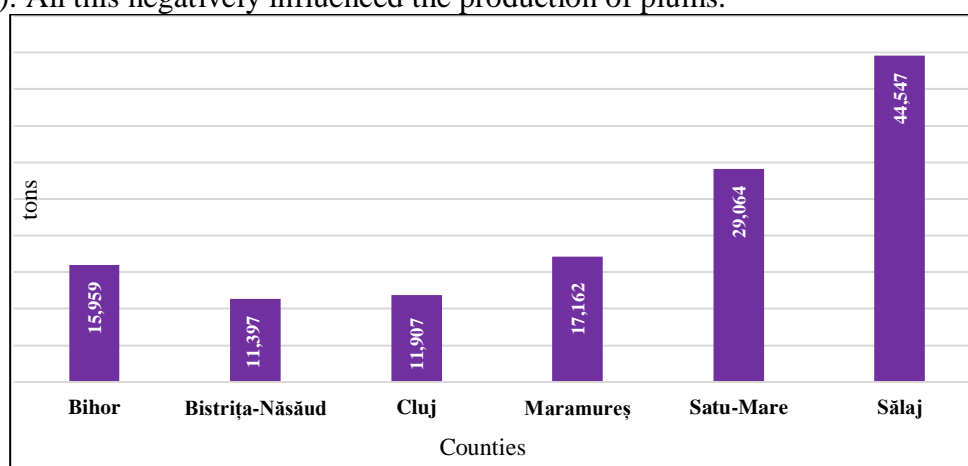
Figure 4. Plum production (tons) in the counties of the North-West Region, 2019
Source: Own graphics based on NIS, Tempo On-line Database, 2020

The private sector brought 129,938 tons of plums in 2019 for the North-West Development Region, ie 99.92%, of which 127,380 tons (98.03%) came from individual farms.

The average plum production for Romania in 2019 was 20 kg / tree (Figure 5). Macroregion One obtained the highest value of 24 kg / tree, above the national average. Also, the counties in the North-West Region had values of the average plum production above the national average: Sălaj county - 27 kg / tree, Satu-Mare - 25 kg / tree and Maramureș - 24 kg / tree, Cluj - 23 kg / tree and Bihor - 22 kg / tree. In Bistrița-Năsăud county, the lowest value was recorded - 20 kg / tree.

Although the Macroregion Four was in first place in terms of the number of plums and plum production, in terms of average production / tree, this Macroregion and Macroregion Tree recorded the lowest values, of 19 kg/tree.
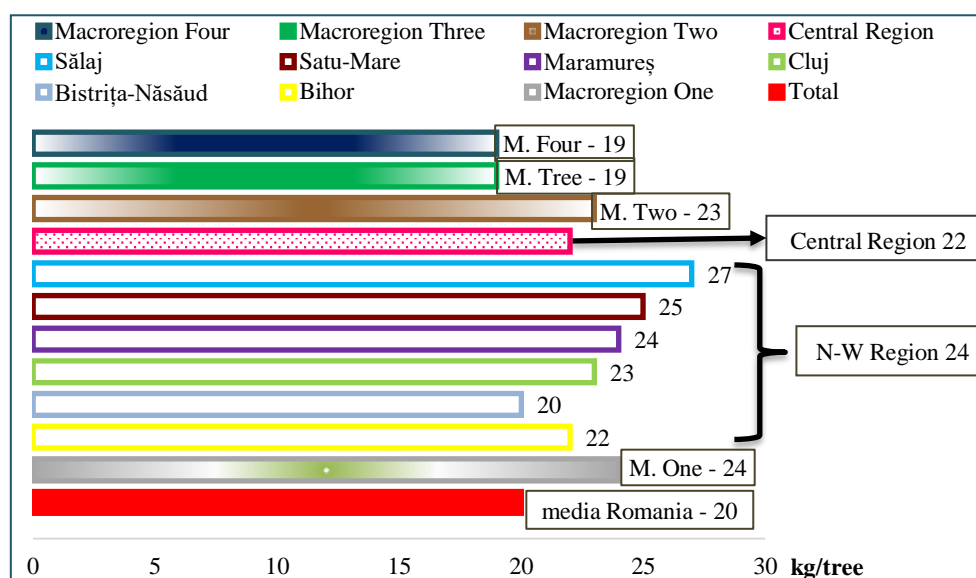
Figure 5. Average plum production (kg/tree) at national level, by Macroregions Development regions and counties, 2019

Source: Own graphics based on NIS, Tempo On-line Database, 2020

According to studies published in 2018 by *Dana D. et al.*, plum growth is favored by natural conditions, but the thermal amplitude higher than 20 °C in November-February has negative effects on the yield (*Dana D. et al., 2018*).

The plum production obtained by Romania ensures the necessary consumption on the domestic market and at the same time represents the raw material for the processing activity. Unfortunately, the income obtained by growers is not in line with their efforts and expectations (*Soare et al., 2019*). A solution must be found to make better use of fresh fruit, to intensify and at the same time to diversify the processing of plums, so that the products obtained can be better used.

CONCLUSIONS

The conclusions that emerge from the analysis regarding the cultivation of plums in the North-West Development Region are the following:

➢ In the ranking of Development Regions with the most plums, North - West Region was on the 3rd place, with 5,352,453 plums. This value represented 75% of the total of Macroregion One, at the level of 2019;

➢ The private sector owned 99.63%, respectively 5,332,599 specimens of plums. Of these, 95.63% belonged to individual holdings;

➢ In Sălaj county were found the most plums - 1,668,719, ie 31.18%, and in Cluj county, the smallest number - 523,281, which represented 9.78%;

➢ The plum production obtained by North - West Region in 2019 was 130,036 tons (77% of the total of Macroregion One) and represented the 3rd value for this indicator at NUTS 2 level;

➢ 99.92% of the plum production of the North-West Development Region came from the private sector, of which 127,380 tons (98.03%) from individual farms;

➢ The largest plum producers were Sălaj counties - 44,547 tons (34.26%), Satu-Mare - 29,064 tons (22.35%) and Maramureș - 17,162 tons (13.20%), and the lowest production was obtained in Bistrița-Năsăud county, - 11,397 tons (8.76%);

➢ The average plum production of the North-West Development Region, of 24 kg / tree, was higher than the average production at country level (20 kg / tree);

➢ At county level, the average production recorded the following results: Sălaj county - 27 kg / tree, Satu-Mare - 25 kg / tree and Maramureș - 24 kg / tree, Cluj - 23 kg / tree, Bihor - 22 kg / tree and Bistrița-Năsăud - 20 kg / tree.

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THE IMPORTANCE OF EARLY DIAGNOSIS IN GYNECOLOGICAL DISEASES AT CATTLE FARMS FOR MILK PRODUCTION

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Abstract
Reproduction also influences the performance of the farm as the evolution of the herd ensures a rhythmicity in the production of veals and especially of the milk (the increase of SP by one month, leads to a loss of 400-500 kg milk / cow). Therefore, on a farm with a CI> 18 months, the exploitation of the cattle milk is totally unprofitable, because the costs of feed and maintenance are not covered.

Key words: cow reproduction disorders, early diagnosis of pregnancy, ultrasound.

INTRODUCTION

It is mandatory for any zootechnical engineer or animal breeder to know to the smallest detail the manifestations of sexual life for both female and male cattles. Sexual life is manifested due to a genetic instinct and attraction between two individuals of the opposite sex in order to perform sexual intercourse. This instinct occurs after the genitals develop and are able to release sex hormones.

The target of this dissertation is to demonstrate the importance of early diagnosis in reproductive diseases, their main causes, and the application of appropriate treatments, respectively the reduction to the minimum of the animals with gynecological diseases in the herd.

MATERIALS AND METHODS

The researches were carried out on a private farm in Halmășd village, Sălaj county, a farm established in 2015, with a number of 191 adult cattles (young cattles were not taken into account, as they were not subject to gestational controls).

The Hollstein breed dominates in the exploitation of the farm, followed by the Romanian Spotted and the Jersey breed.

There were performed 7 periodic gynecological examinations by ultrasound during 2019 with the following dates: 01/17/2019; 02/27/2019; 04/18/2019; 04/06/2019; 08/08/2019; 03/10/2019; 12/12/2019.

It can be observed, that these regular gynecological examinations are performed regularly every 6-8 weeks, depending on the needs and taking into consideration the following aspects::

-cattles inseminated less than 28 days ago are not controlled;

- cattles, by which the interval between the date of parturition and the date of control is less than 14 days are also not checked;

- cattles at breastfeeding rest are not checked either.

RESULTS AND DISCUSSIONS
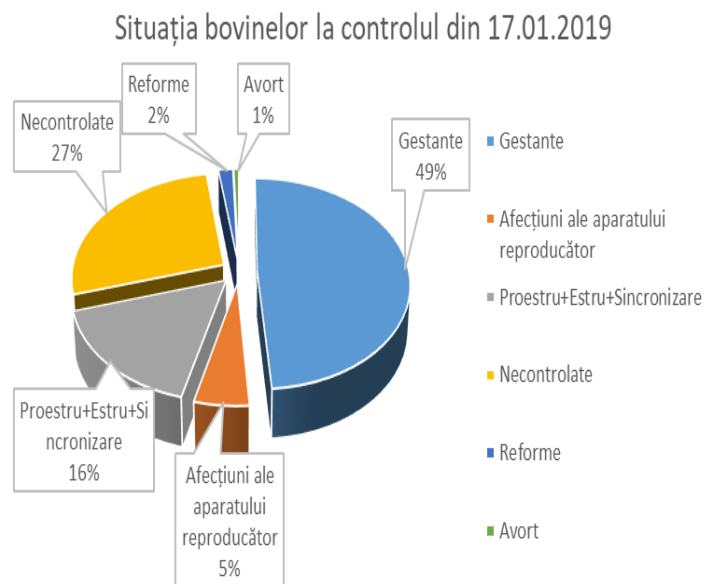
Fig. 1. The control carried out on 17.01.2019

40
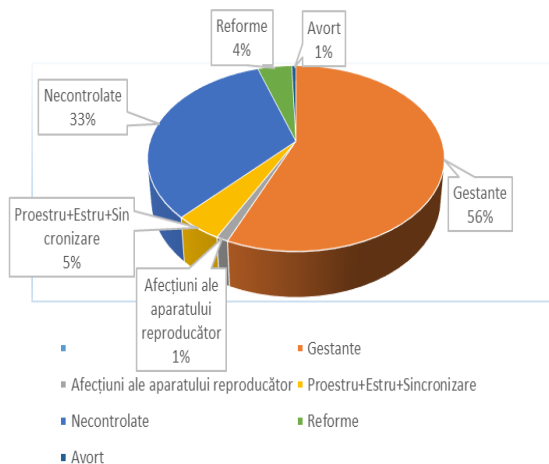
Fig. 2. The control carried out on   17.01.2019

Pathological entities found in the ovaries and uterus at the control on 17.01.2019:

Hypotrophic ovaries - 3 cattles

Polycystic ovaries - 2 cattles

Purulent collection - 2 cattles

Endometritis - 1 cattle

Diseases found in the ovaries and uterus at the inspection on 27.02.2019:

Ovarian cyst - 1 cattle

Endometritis - 1 cattle

At the control on 18.04.2019 there were 5 females which had had an abortion, one of them being in an earlier stage of gestation (embryonic death). One of the 5 aborted bovine heads falls into the reform category due to the fact that it had ovarian adhesion.

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At the control on 04.06.2019, 6 cattles were identified with abortion.
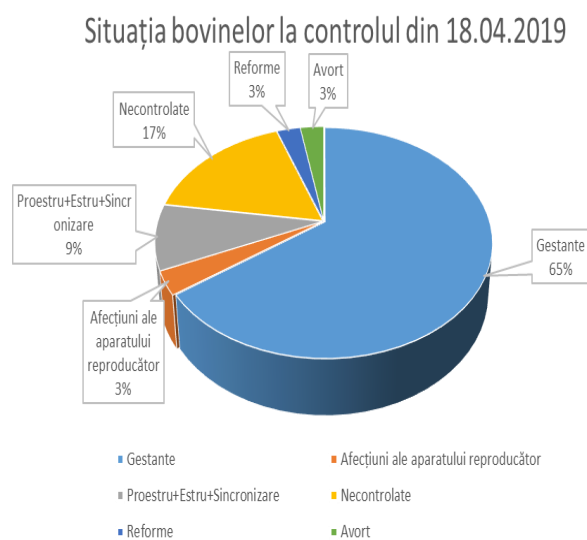
Fig.3. The control carried out on 18.04.2019
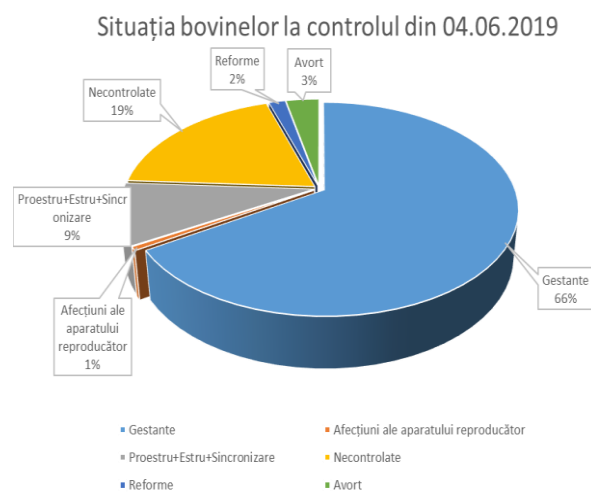
Fig.4. The control carried out on 04.06.2019
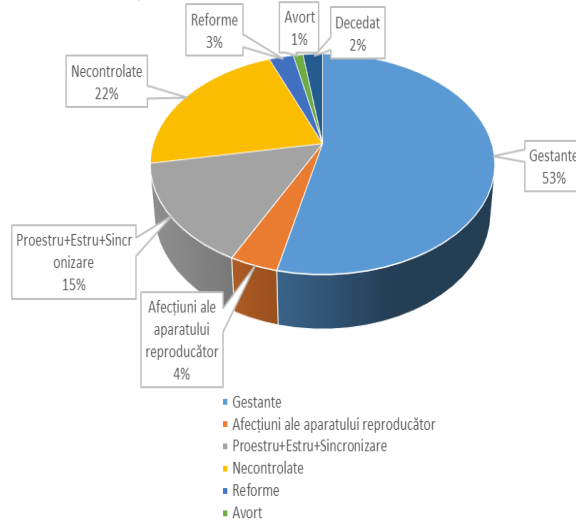
Fig.5. The control carried out on 08.08.2019

Figure 5 shows that in the reform category we have 5 heads: those 3 presented at the exploitation of the farm and at previous controls and two cattles, that had repeated inseminations and were considered economically unjustified to repeat these on them. The latter will be slaughtered when their milk production falls below profitability.
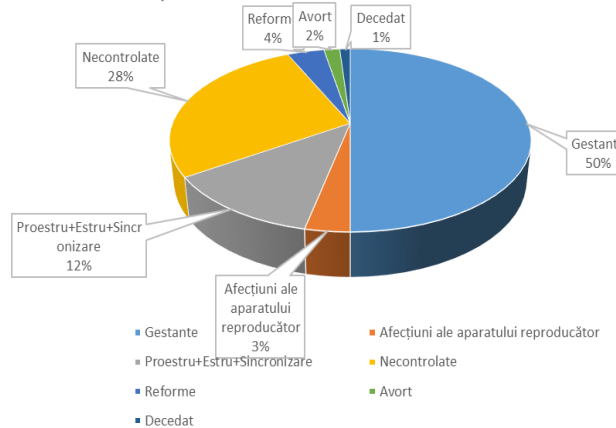
Fig.6. The control carried out on 03.10.2019

Figure 6 shows that in the reform category we have 7 females: those 5 included in reform category and at previous control, a cattle that was inseminated several times and did not remain pregnant and a cattle that will be slaughtered due to podal disease. These will be removed from the exploitation when it is no longer justified to keep them on the farm from an economical point of view/economically speaking.
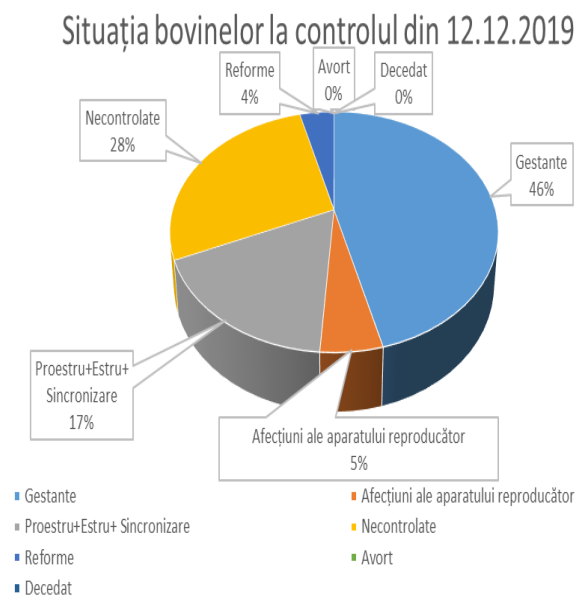
Fig.7. The control carried out on 12.12.2019

Pathological entities found during the control on12.12.2019:
- Ovarian cyst - 3 cattles;
- Polycystic ovaries - 1 cattle;
- Persistent yellow body - 2 cattles;
- Purulent collection - 1 cattle;

In the reform category we have 7 heads, those presented at the exploitation on the farm and at previous controls. It is a positive aspect that it was not considered necessary to include other cattles in this category.

Between 03.10.2019 and 12.12.2019 there were neither abortions nor deaths.

CONCLUSIONS

Grafic pentru anul 2019

	17.01.19	27.02.19	18.04.19	04.06.19	08.08.19	03.10.19	12.12.19
Gestante	49%	56%	65%	66%	53%	50%	46%
Avorturi	1%	1%	3%	3%	2%	2%	0%
Mortalități	0%	0%	0.50%	0%	2%	1%	0%
Afecţiuni ale aparatului reproducător	5%	1%	3%	1%	4%	3%	5%
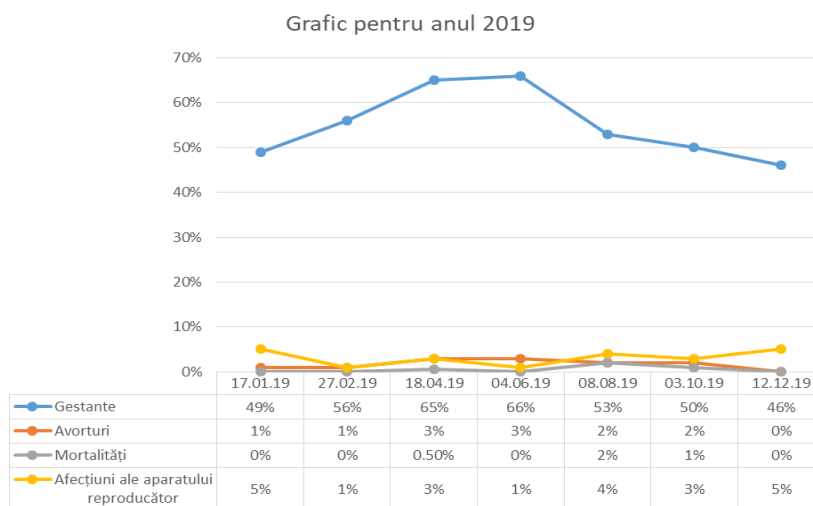
Fig.8. Graphical representation of pregnancy, abortion, mortality and
reproductive organs disorders during 2019

The graphic above shows that for the entire analyzed period out of the total herd controlled:
- the share of pregnant females was between 46% and 66%;
- the number of abortions was between 0% and 3%;
- the number of animals with reproductive disorders remained below 5%.

These controls are important, because they allow the establishment of the gynecological structure of the herd, offering the possibility to eliminate the individuals with diseases of the reproductive system as soon as possible, thus leading to a more productive herd and a profitable business.

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MORPHOLOGICAL PERFORMANCE OF THE GUINEA FOWL (*NUMIDA MELEAGRIS*) POPULATION IN BIHOR COUNTY

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Abstract
The study presents the partial results, regarding the morphological performances of some birds of the order Galliformes, the genus Numida, the species Numidameleagris, from the territory of Bihor county. The presented work was carried out in three private farms in Oradea as well as on the territory of Bihor County, being analyzed 252 specimens from the guinea fowl population, respectively 40 males and 212 females. The following morphological parameters were analyzed: knowledge of breed characteristics as well as the quality of eggs intended for incubation (egg weight, mineral shell thickness, format index and Haugh index).

Key words: Breed traits**,**dynamic, incubation, eggs weight**,** shell thickness.

INTRODUCTION

The gray guinea fowl comes from the African continent, where it was domesticated in antiquity. Throughout history, the numbers on the European continent have been reduced numerically, a repopulation and a better spread of this species being made after 1500 AD, a period in which, probably, the Romanian territory was also populated.It is not known exactly the moment of propagation of the number of guinea fowl in the North-West of the country, but it is known that the local population raises these birds, along with palmipeds, to obtain traditional products from their meat, which have special organoleptic properties.

MATERIALS AND METHODS

The data collected were obtained from private farms, namely: in the C1 farm, 65 heads (10 males and 55 females), the C2 farm, 99 heads (16 males and 83 females), the C3 farm, 88 heads (14 males and 74 females). As biological material were used birds of both sexes, of different ages, (hatching, in the juvenile period, when reaching sexual maturity, in the active period of reproduction).

Were used the following materials and working devices: technical and analytical digital balances, calipers, Petri plates and flat glass plates, small incubators (50-200 eggs/ series) portable ovoscope, camera, computer

equipped with spreadsheet software, depending on the experimental method addressed.

The results obtained were compared with the reference values in the literature (Sauveur, B., 1988; MG Usturoi, 1999; Vacaru-Opriş I. et al., 2002).

The experimentally obtained data were centralized and statistically processed.

RESULTS AND DISCUSSION

Of all the populations analyzed, the most precocious birds existed in farm 3, where the lowest mortality was recorded. The age of laying the first egg varied between 202-212 days.

The qualitative parameters of the hatching eggs were analyzed in dynamics, starting from the beginning of laying (29-33 weeks), passing successively through the laying top (34-36 weeks), the laying plateau (37-50 weeks) and ending with the end laying eggs (65 weeks).

The average weight of the eggs changed from 43.9 ± 0.5g at the beginning of laying to 46.6 ± 0.8g.

The average thickness of the mineral shell evolved inversely proportionally, in relation to the weight of the eggs, decreasing from the value of 0.500 ± 0.008 mm, to the value of 0.470 ± 0.005 mm, at the end of laying (table1).

Table 1

Dynamics of the incubation eggs weight (g), during laying period, in the studied Grey Guinea fowl populations

Moment of egg laying	C1 (n=25)		C2 (n=25)		C3 (n=25)		Average farms	
	$\overline{X} \pm S_{\overline{x}}$ (g)	V%	$\overline{X} \pm S_{\overline{x}}$ (g)	V%	$\overline{X} \pm S_{\overline{x}}$ (g)	V%	$\overline{X} \pm S_{\overline{x}}$ (g)	V%
Begining (29 weeks)	43,2 ±0,5	6,2	44,8 ±0,3	9,3	43,7 ±0,7	11,7	43,9 ±0,5	10,2
Top (35 weeks)	44,1 ±0,4	9,7	45,3 ±0,3	5,4	44,9 ±0,6	6,9	44,8 ±0,4	7,1
Plateau (43 weeks)	45,4 ±0,7	8,1	46,1 ±0,5	6,9	45,8 ±0,5	5,4	45,8 ±0,6	6,2
The end (65 weeks)	46,3 ±0,9	9,3	46,9 ±0,8	8,2	46,5 ±0,8	9,8	46,6 ±0,8	9,3

Index eggs format has changed during production period, varying between the limits of 75.5% and 77.4% (population average) (table 2)

Table 2

Values of the shape index (%) of the incubation eggs, across the laying period

Moment of egg laying	C1 (n=25)		C2 (n=25)		C3(n=25)		Average farms	
	$\overline{X} \pm s_{\overline{x}}$ (%)	V%	$\overline{X} \pm s_{\overline{x}}$ (%)	V%	$\overline{X} \pm s_{\overline{x}}$ (%)	V%	$\overline{X} \pm s_{\overline{x}}$ (%)	V%
Begining (29 weeks)	75,00 ±1,7	12,4	76,00 ±0,7	7,9	75,51 ±1,1	9,5	75,5 ±1,2	18,3
Top (35 weeks)	75,51 ±1,4	5,1	76,47 ±0,6	6,8	76,00 ±0,5	6,4	76,0 ±0,8	6,2
Plateau (43 weeks)	76,00 ±0,7	8,7	76,92 ±1,1	8,1	76,47 ±1,8	8,5	76,5 ±1,2	8,4
The end (65 weeks)	76,92 ±1,3	7,1	77,78 ±0,6	7,9	77,36 ±0,6	7,5	77,4 ±0,8	7,6

The Haugh index, which shows the most synthetic the quality of the egg, had average values between 75.3 U.H. and 77.7 UH, with the highest value at the beginning of laying (77.7 UH) (table 3), a situation that confirms the quality of the eggs produced, which are successfully suitable for incubation (standard: 75-82 UH – Usturoi M., 1999).

Table 3

Haugh index values (U.H.), across the laying period in Grey Guinea fowl studied population

Moment of egg laying	C1(n=25)		C2(n=25)		C3(n=25)		Average farms	
	$\overline{X} \pm s_{\overline{x}}$ (U.H.)	V%	$\overline{X} \pm s_{\overline{x}}$ (U.H.)	V%	$\overline{X} \pm s_{\overline{x}}$ (U.H.)	V%	$\overline{X} \pm s_{\overline{x}}$ (U.H.)	V%
Begining (29 weeks)	77,2 ±1,1	11,8	78,0 ±1,3	11,5	77,8 ±1,4	11,7	77,7 ±1,3	11,1
Top (35 weeks	76,1 ±1,8	13,9	76,3 ±1,6	11,3	75,8 ±1,7	12,4	76,1 ±1,6	12,3
Plateau (43 weeks))	75,5 ±1,8	12,5	76,0 ±1,4	12,4	75,4 ±1,1	11,6	75,6 ±1,4	12,1
The end (65 weeks)	75,2 ±1,3	11,8	75,7 ±0,9	11,1	75,1 ±1,5	10,3	75,3 ±1,2	11,2

CONCLUSIONS

The specimens of the *Numidameleagris* population, existing in the private farms in Bihor county were characterized by a spawning intensity of 86.5% in the laying top, in these conditions obtaining an average annual production of 161.6 eggs / bird, the value being 5% lower than the recommendations of the standard (170 eggs per introduced female / year), (Dodu M.2010)**.**

The quality of the hatching eggs was assessed as mediocre to good, even in the conditions in which the eggshell became more and more friable towards the end of the reproduction period, the statistical parameters of the

incubation process revealed, as a whole, a fertility value of 89.3% (95-97% in standard), an hatchability of 78.4% (85% in standard) and a hatching percentage of 69.8% (compared to 80% allowed for this species).

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STUDY REGARDING THE HYDROPHYTIC VEGETATION OF THE SALONTEI PLAIN (NORTH WESTERN ROMANIA)

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Abstract
The hydrophytic vegetation, once abundant in the Salontei Plain, has shrunk, following man-made drainage in the waters of lakes, fisheries and canals, where today it develops lushly, accelerating the process of clogging water basins.

In the meadowlands of the Salontei Plain there are a lot of permanent water pools, stagnant water channels, ponds with permanent water storage, dams, drainage and storage basins with rich flora and vegetation suitable for a complex phytocoenological research and an ecologic study of the hydrophytic vegetation.

This study aims to analyze the phytocoenoses of the association Lemnetum minoris Oberdorfer ex. Th. Müller et Görs 1960 in terms of floristic composition, life forms, floristic elements, ecological indices and karyotype.

Key words: phytocoenoses, floristic composition, ecological indices, life forms, karyotype, floristic elements, hydrophytic vegetation.

INTRODUCTION

Under normal conditions, the association *Lemnetum minoris* is the starting point of the entire succession of aquatic vegetation, it being a pioneering association, which prefers sunny streams, where it multiplies rapidly in vegetatively way.

Chorology: the association is frequently spread, being quoted and described from all the provinces of the country, respectively from Muntenia (Nedelcu, 1967, 1969, 1972; Popescu et al., 1984; Ionescu-Țeculescu, 1971; Ștefan, 1980); Oltenia (Păun, 1969; Sanda et al., 1980); Banat (Grigore, 1971); Moldova (Mititelu, 1971; Mititelu et al., 1975, 1994; Chifu et al., 1974; Dobrescu, 1981); Bucovina (Toma, 1976); Transilvania (Kovács, 1969; Popescu, 1974; Sămărghițan, 2001; Ardelean, 1999); Dobrogea (Pop, 1977; Nedelcu et al., 1986; Ștefan et. al, 1995; Popescu et al., 1997); Maramureș (Resmeriță, 1974); Crișana (Pop, 1968; Karácsonyi, 2011).

The phytocoenoses of the association *Lemnetum minoris* develop in permanent water pools, stagnant water channels, collector channels, ponds with permanent water storage, dams, drainage and storage basins in the area of the localities Cefa, Mărțihaz, Mădăras (*Fig. 1*), Salonta and Homorog.

Fig. 1 – **Lemnetum minoris** Oberdorfer ex. Th. Müller et Görs 1960, stagnant water channel, Mădăras locality (Bihor County)

MATERIAL AND METHODS

Framing the association to the corresponding cenotaxonomic units – alliance, order and class was made according to the traditional ecological and floristic systems elaborated by Tüxen (1955), Braun–Blanquet (1964), Borza et Boşcaiu (1965), Soó (1964-1980), as well as on the basis of the most recent works belonging to Mucina (1997), Rothmaler (1994, 2000), Borhidi (1996, 2003), Coldea et al. (1997); Sanda et al. (2008).

The study of the hydrophytic vegetation of the Salontei Plain was made taking into consideration the phytosociological research method of the European Central School, based on the principles and methods elaborated by Braun–Blanquet (1964) and adapted by Borza and Boşcaiu (1965) to the particularities of the vegetation carpet from our country.

The taxa identified in the field have been recognized by specialty catalogues "Romania's Illustrated Flora" (Ciocârlan, 2009), in conjunction with the information provided by the "International Code of Botanical Nomenclature" (Code de Tokyo, 1993).

The association synthetic table was structured after the methodology proposed by Braun–Blanquet (1964) and developed by Ellenberg (1974); therefore, in the column header of the table for the association analyzed the following have been entered: the serial number of land surveys, altitude (m.s.m.), area (m²), coverage of grass layer (%). At the end of the table, the last two columns included the synthetic phytocoenological indices, constancy (K) and abundance–dominance index (ADm).

The constancy highlights the extent of coenotic fidelity of each species to the phytocoenosis environment of the association, according to the Braun–Blanquet et Pavillard methodology (1928). The abundance and

dominance highlight the percentage of average coverage achieved by phyto–individuals of a phytocoenosis.

Establishment of the values for ecological indices, life forms, floristic elements and karyotype were made after the synthesis works elaborated by Raunkiær (1937), Braun–Blanquet (1951), Meusel et Jäger (1992), Ellenberg (1974, 1979), Ellenberg et al. (1992), Soó (1964-1980), Májovsky et Murin (1987), Sanda et al. (2003), Pop (1977, 1982), Ciocârlan (2009).

RESULT AND DISCUSSION

The phytocoenoses of this association are bilayered, poor in species, the swimming layer being dominated by the edifying species *Lemna minor*, with a coverage of 82.5% and a maximum constancy (K = V), along with which characteristic species develop for the alliance ***Lemnion minoris*** and the order ***Lemnetalia minoris*** (*Lemna trisulca*, *Spirodela polyrhiza*) and for the class ***Potamogetonetea pectinati*** (*Potamogeton nodosus*).

The submerged layer consists of the species *Ceratophyllum demersum*, *Potamogeton pectinatus*, *Myriophyllum spicatum* belonging to the class ***Potamogetonetea pectinati*** (*Table 1*).

In the phytocoenosis are present transgressive plants of the class *Phragmitetea australis* (*Glyceria fluitans*, *Eleocharis palustris*, etc.).

Table 1

Lemnetum minoris Oberdorfer ex. Th. Müller et Görs 1960

L.f.	F.e.	W	T	S.r.	2n	No. Land Surveys	1	2	3	4	5	K	ADm
						Altitude (m.s.m.)	100	95	95	94	106		
						Area (m²)	6	8	5	5	6		
						Coverage of grass layer (%)	96	95	92	75	92		
Hh	Cosm	6	0	0	P	As. *Lemna minor*	5	5	5	4	5	V	**82,5**
						Lemnion minoris, Lemnetalia minoris, Lemnetea							
Hh	Cosm	6	3,5	0	P	*Spirodela polyrhiza*	+	.	+	1	+	IV	**1,3**
Hh	Cosm	6	0	4	P	*Lemna trisulca*	.	1	.	+	+	III	**1,2**
						Potamogetonetea pectinati							
Hh	Cosm	6	3	4,5	P	*Potamogeton pectinatus*	+	+	+	+	.	IV	**0,4**
Hh	Cosm	6	3	0	D	*Ceratophyllum demersum*	1	.	+	.	+	III	**1,2**
Hh	Cp-Bo	6	3,5	4	P	*Potamogeton nodosus*	.	+	+	.	+	III	**0,3**
Hh	Cp-Bo	6	0	4,5	P	*Myriophyllum spicatum*	+	.	.	1	.	II	**1,1**
						Phragmitetea australis							
H	Cp-Bo	5	0	2	P	*Epilobium palustre*	+	.	+	.	+	III	**0,3**
Hh	Eua	6	0	4	D	*Alisma lanceolatum*	.	+	.	+	.	II	**0,2**
Hh-H	Eua	5	3	0	P	*Mentha aquatica*	+	.	.	+	.	II	**0,2**
Hh	Cosm	5	3	0	P	*Glyceria fluitans*	.	.	+	.	+	II	**0,2**
G-Hh	Cosm	5	0	4	DP	*Eleocharis palustris*	.	.	+	.	+	II	**0,2**
Hh	Cp-Bo	6	3,5	0	DP	*Berula erecta*	+	.	.	+	.	II	**0,2**
H-Hh	Eua	5	3	0	P	*Myosotis scorpioides*	.	+	.	.	+	II	**0,2**
						Variae syntaxa							
Th	Eua	4,5	3	0	P	*Bidens tripartita*	+	.	+	.	.	II	**0,2**
H	Eua	4	4	4	D	*Juncus inflexus*	.	.	+	.	+	II	**0,2**

Phytocoenological table of *Lemnetum minoris Oberdorfer ex. Th. Müller et Görs 1960* association, where:
L. f. - life forms; F. e. - floristic elements; W - soil wet; T - temperature; S. r. - chemical reaction of the soil; 2n - karyotype; K - constancy; ADm - abundance-dominance; Hh – hydrophytes; H – Hemicryptophytes, Th – Annual Therophytes, Eua – Eurasian, Cp-Bo – Circumpolar-Boreal, Cosm – Cosmopolitan, D – diploidy, P – polyploidy, DP – diplo-polyploidy.
Place and date of surveys: 1 – Collector channel, Cefa locality (Bihor County) 02.08.2019; 2 – Dam with permanent water retention, Mărţihaz locality (Bihor County) 02.08.2019; 3 – Stagnant water channel, Mădăras locality (Bihor County) 02.08.2019; 4 – Collector channel, Salonta locality (Bihor County) 02.08.2019; 5 – Permanent water pool, Homorog locality (Bihor County) 02.08.2019.

The spectrum of bioforms (*Fig. 2*) highlights the high share of hydrophytes, in proportion of 68.75%, followed by hemicryptophytes (18.75%), respectively geophytes and annual therophytes (6.25%).
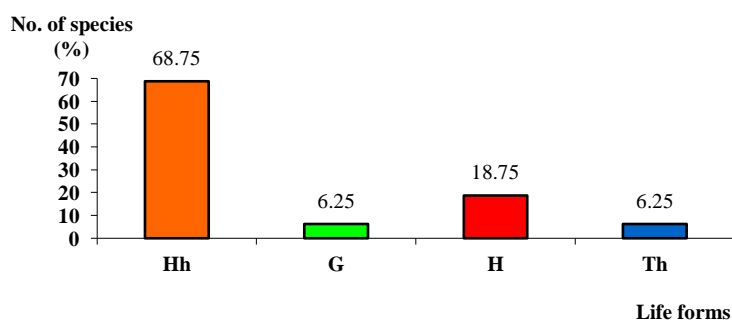
Fig. 2 – The life forms spectrum of **Lemnetum minoris** association, where:
Hh – hydrophytes, G – geophytes, H – hemicryptophytes, Th – annual therophytes.

The spectrum of floristic elements (*Fig. 3*) indicates that cosmopolitan species predominate (43.75%), followed by eurasian species (31.25%) and circumpolar-boreal species (25%).
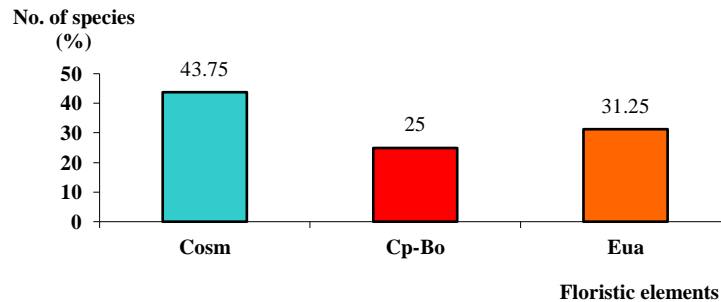
Fig. 3 – Floristic elements spectrum of the **Lemnetum minoris** association, where: Cosm – Cosmopolitan, Cp-Bo – Circumpolar-Boreal, Eua – Eurasian.

The diagram of ecological indices (*Fig. 4*) highlights the dominance of hydrophile species (56.25%), complemented by hygrophilous ones (31.25%). The thermal regime bears the imprint of micro-mesothermic species in equal measure with the eurythermal ones, with 37.5% each. From the point of view of the chemical reaction of the soil, the amphitolerant species (50%) stand out, followed by the weakly acid-neutrophilic ones (43.75%).

Fig. 4 – Diagram of ecological indices for the **Lemnetum minoris** association, where: W – soil wet, T – temperature, S. r. – chemical reaction of the soil.

Regarding the karyotype, the analysis of the karyological spectrum (*Fig. 5*) indicates that the majority are polyploid species (68.75%), followed by diploid species (18.75%), the diploid index having the value of 0.27.
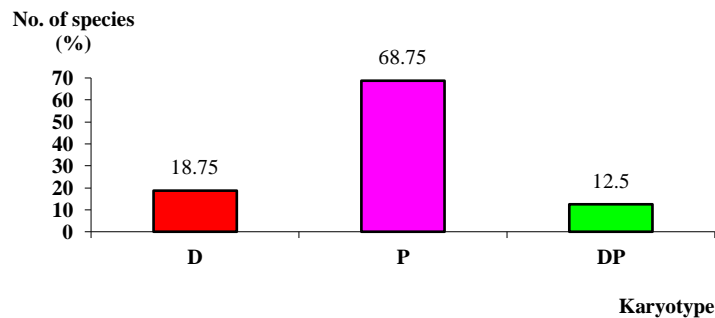
Fig. 5 – The karyotype spectrum of **Lemnetum minoris** association,
where: D – diploidy, P – polyploidy, DP – diplo-polyploidy.

CONCLUSIONS

The mention of the *Lemnetum minoris* association within the study of the hydrophytic vegetation of the Salontei Plain, brings an extra information on the chorology of the vegetation from this part of the country.

The installation and development of this kind of hydrophytic phytocoenosis is favored by stagnant water channels, collector channels, ponds with permanent water storage, permanent water pools, dams, drainage and storage basins, with good mineral trophicity and a weakly alkaline chemical reaction.

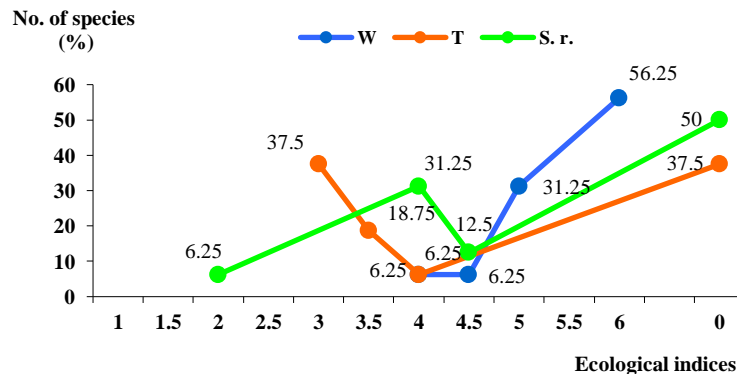The results of the analysis for the association *Lemnetum minoris* indicate that it is well outlined, with a varied composition and structure, and our results are in line with the specialty literature.

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COMPARISON BETWEEN THE MAXIMUM INCLUSION OF ESSENTIAL FATTY ACIDS IN THE SANA COMPARED TO THE MATURE TELEME CHEESE

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Abstract

Two dairy products from two different categories were produced in the manufacturing system. The two products are: sana, from the category of acidic dairy products and matured teleme cheese, from the category of cheeses.

Because dairy products are low in essential fatty acids, their aim is to enrich them in these components. Given that milk fat is found in the form of globules wrapped in an elastic lyopoprotein membrane, it is proposed to incorporate fatty acids from fish oil into milk fat globule raw material used in the manufacture of products and protect them during the technological process.

They were obtained, three samples of jelly and matured Telemea cheese were obtained and the percentage of fish oil added in milk was progressive, respectively: 0.05%; 0.10% and 0.015%. Witness samples were also produced, without the addition of fish oil.

We analyzed the maximum limit of three essential fatty acids in fish oil that are representative of milk composition and fish oil composition.

For the three essential fatty acids studied, the maximum limit of fish oil added to milk in order to incorporate them into the fat globule of milk was for telemea cheese matured in the case of 0.0950% linoleic acid, in the case of 0.1050 γ – linolenic acid.

Also in the case dairy acid products sana these percentages are: in the case of linoleic acid it does not exist, in the case of linolenic acid of 1,3009% and in the case of γ-linolenic acid of 1,4090.

The statistical analysis shows a difference between sana and mature telemea of 1.047% in terms of concentration of fish oil added to milk at the maximum limit of incorporation of essential fatty acids in lactic fat.

Key words: sana, ripened teleme cheese, essential fatty acids.

INTRODUCTION

The fermentation of lactose into lactic acid by lactic acid bacteria is a safe and environmentally friendly technology that can alter the function of food ingredients (including proteins). These fermentations also reduce the content of free sulfhydryl (SH) (Liangjie Tian, 2020).

Two strains of lactic acid bacteria (LAB) (Lactobacillus rhamnosus and Lactococcus lactis) and one strain of yeast (Saccharomyces cerevisiae),

alone or in combination, reduce the levels of aflatoxin M1 (AFM1) in cheese during 30 days of storage (Bruna Leonel Gonçalves, 2020).

Lactic bacteria (LAB) (Lactococcus lactis FT27 and Carnobacteroim divergens SCA) but also their combination have antilisterial activity against four Listeria monocytogenes biotypes isolated from matured cheese (Stefano Morandi, 2020).

Lactococcus lactis subsp. Lactis are lactic acid bacteria capable of producing nisin, which is an effective antilisterial peptide that could be used to design active food packaging.

Packaging supplemented with protein hydrolysates or sodium caseinate inhibits the growth of the pathogen during the 21 days of storage at 4 ° C. This was due to the generation of organic acids by lactic acid bacteria. Therefore, packaging lined with nutrient-supplemented films can act as carriers of L. lactis and can contribute to increasing the safety of pasteurized drinking milk but also of refrigerated dairy products (Laura Settier-Ramírez, 2020).

Enterococcus fecalis 2/28, isolated from artisanal cheese, have the ability to release bioactive biopeptides from serum proteins.

These peptides may have inhibitory activity on the angiotensin I converting enzyme (ACE) and dipeptidyl peptidase IV (DPP-IV), with ACE inhibition being stronger than that of DPP-IV. (Paulina Worsztynowicz, 2019)

The interactions of exopolysaccharides and proteins are of great importance in food science.

This is favored by lactic acid bacteria in the binding of hetero-polysaccharides to various milk proteins (β-casein, K-casein, native and heat-treated, β-lactoglobulin) at pH 4.0–5.0 (Johnny Birch, 2017).

In addition to lactic acid bacteria and nutrients in milk and dairy products, the beneficial influence of essential fatty acids is known.

Essential fatty acids (EFAs) as food supplements are used in the treatment of dry eyes to reduce inflammation in the eye surface. EFAs can interact with tear lipids and affect tear stability (Poonam Mudgi, 2020).

Dry eye is a common condition that can severely affect your quality of life. Systemic and topical omega-3 fatty acids and omega-6 fatty acids may have been used as a treatment for patients with dry eye disease and have shown promising results (Ammar M. Al Mahmood, 2014).

Fish is an important source of essential fatty acids. Fish is also a pure protein resource. For a balanced diet, romanians should eat about two fish or seafood meals a week.

According to statistics, at the moment in Romania we consume, on average, a fish meal every three weeks, which is extremely low (Morna Anamaria, 2017).

It is therefore beneficial to enrich dairy products in essential fatty acids by adding fish oil.

Unsaturated fats also improves the rheological qualities of the prosus (Morna Anamaria, 2018).

MATERIAL AND METHOD

The two dairy products that were analyzed were obtained in the manufacturing system. Sheep milk was used harvested in April period which is characterized by a lower concentration of milk components, including fat.

The raw milk was added fish oil, liver tone.

The mixture of milk and fish oil was homogenized in order to incorporate the fatty acids from fish oil into the fat globule of sheep's milk.

The process of obtaining the products has been modified in order to protect both the fatty acids and the quality of the finished products.

For this purpose, the maturation period of the cheese samples was reduced to two thirds of the nominal one by increasing the temperature by about 2-3 ° C.

The acidity of the milk and by-products was monitored using the method for determining titratable acidity. The areometric method was used to analyze the milk density.

The fat percentage of raw milk and finished products was determined using the acid-butyrometric method.

Organoleptic analysis of the cheese samples was performed by three unauthorized persons. It has been appreciated, in particular, the flavor and aroma of the products which can be affected by the fish taste of fish oil added.

The total dry matter of the cheese samples was analyzed by the oven drying method and the salt content was determined by the Mohr method.

The fatty acids in the samples were analyzed by gas chromatography. 19 saturated and unsaturated fatty acids were analyzed, of which 3 essential fatty acids were analyzed.

For analysis of the results staticstică methods were used for comparison between the samples and the control sample compared to the ANOVA.

The maximum point of incorporation of fatty acids from fish oil into the milk fat globule with the Receiver Operator Characteristic (R.O.C.) curves has been established.

RESULTS AND DISSCUSIONS

In this study we were made two dairy where it tried incorporation of essential fatty acids in fish oil added to raw milk sheep. Fish oil was added in progressive concentrations as follows: 0.05%; 0.10%; 0.15%. There was also a control sample without the addition of fish oil.

The coding of the samples is presented in table no. 1

Table 1

Coding of samples

No. cr.	Add fish oil %	Sample code	
		Sana	matured teleme cheese
1	0	S_0	Tm_0
2	0,0,5	$S_{0,05}$	$Tm_{0,05}$
3	0,10	$S_{0,10}$	$Tm_{0,10}$
4	0,15	$S_{0,15}$	$Tm_{0,15}$

In the presented analysis, 19 fatty acids from the composition of the 4 samples of sana and 4 samples of matured teleme cheese were determined by gas chromatography.

The evolution of saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA) was analyzed. It can be seen that the addition of fish oil in sheep's milk raw material used to obtain samples decreases the concentration in SFA and increases the concentration in MUFA.

The decrease in SFA occurs by 1.89 percent in the samples of sana and by 2.49 in the samples of matured teleme. Therefore the superior evolution in the case of the samples of matured teleme.

The increase in MUFA occurs by 2.49 percent in the samples of sana and by 0.6 in the samples of matured teleme. These results are not conclusive because they do not depend on the addition of fish oil.

The concentration of PUFA is clearly increasing by increasing the concentration of fish oil added to milk.

This demonstrates that the polyunsaturated fatty acids in the composition of fish oil are found in samples of manufactured dairy products.

Evolution of unsaturated fatty acids in samples of matured teleme compared to those of sana: it is observed that in the cheese samples the increase is by 0.9 percent and in the case of the sana samples it is 1.22. In conclusion, sana samples more effectively incorporate essential fatty acids from fish oil added to raw milk.
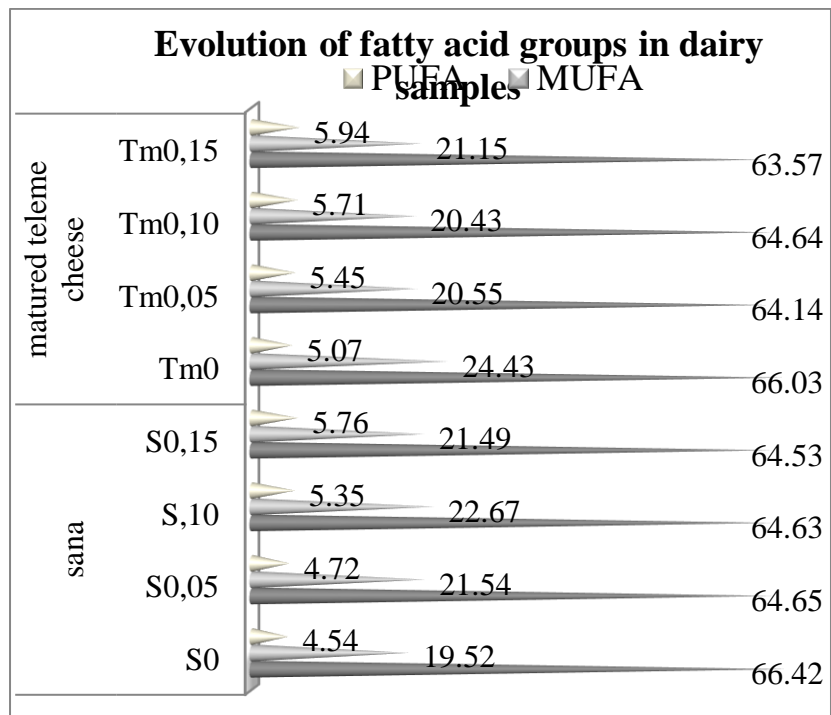
Figure 1 Evolution of fatty acid groups in dairy samples

Among the PUFAs, three essential fatty acids were analyzed, which are specific for both the composition of sheep's milk and fish oil: linoleic acid, linolenic acid and γ-linolenic acid. The concentrations of fish oil at the maximum incorporation limit of those three essential fatty acids analyzed are shown in figure 2.

Evolution of essential fatty acids in sanna compared to those of matured teleme enriched in essential fatty acids
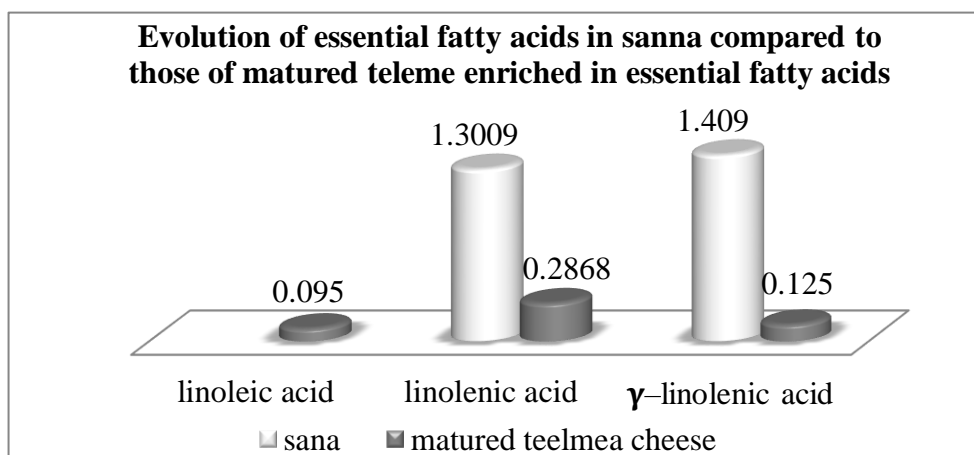
Figure 2 Evolution of essential fatty acids in sanna samples compared to those of matured teleme enriched in essential fatty acids

In figure 2 it is seen that the samples of linoleic acid buttermilk if there is no maximum limit for embedding. This is due to the pasteurization of milk at high temperature which can cause thermal breakdown of the fat globule membrane. Linoleic acid has an embedding limit of about 4 times higher in matured teleme and γ-linolenic acid more than 10 times.

CONCLUSIONS

The addition of fish oil in the raw material milk used in the manufacture of sana and matured teleme cheese increases the concentration of essential fatty acids in the two products obtained in the manufacturing system and analyzed.

The study showed that dairy products enriched in essential fatty acids can be obtained by adding fish oil.

Analyzing the concentration of added fish oil, at the maximum incorporation limit, it can be seen that those studied are appropriate. It should be considered in this regard, that under industrial conditions occurring biochemical changes that can determine variations in the evolution of essential fatty acids.

If we consider the sana dairy product and the matured telemea cheese, it can be stated that the incorporation of fatty acids from fish oil into lactic fat is superior in the case of sana compared to that of cheese.

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CLINICAL AND PROFILACTIC ASPECTS OF CALCIUM AND PHOSPHORUS DEFICIENCY IN LARGE BREED DOGS

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Abstract
The aim of this study was to highlight the joint and growth problems encountered in the large breed dogs during the developmental period. Abnormal joint appearance and the diversion of the long bones especially, is a problem that can be easily handled at a young age and it can be solved through vitamin and mineral supplementation. The diversion of the hooks is an affection that can occur both in a mineral and vitamin deficiency, but can also be a result of some inherited genes. Our research was conducted on 8 dogs of different sex, age and breed. All of the clinical cases needed help regarding the food and the supplements in order to avoid the occurrence of rickets, panosteitis or other bone and joint problems. From the 8 cases, 4 of them were female dogs and 4 males, with ages between 4 weeks and 24 months, each case presented joint and bone modifications, more or less obvious, affecting both front and hind legs. At the biochemical test, was observed the modification of the serum calcium, which was lower than normal, in 3 cases. The clinical examination showed that each dog, during the growth period, did not receive proper food and supplements according to the age and breed, therefore they presented joint thickening, diversion of the long bones, diversion of the front and hind legs, spreading of the paws and difficulty during moving. Therefore, it is important to establish for all growing large breed puppies a mineral and vitamin treatment, for sustaining the organism and to be additional to a Super Premium food. At studied cases was observed different response in administrating the vitamin and mineral supplements, depending on breed, therefore it is required to follow the recommended scheme.

Key words: rickets, phospho-calcic deficiency, large breed dogs, growth supplements

INTRODUCTION

Nutrition-related factors maintaining health, longevity, performance and disease prevention, thus improving the quality of life. Nutrition has an important role in the growth and development of young people belonging to large breeds, and the object of this paper is to highlight the osteo-articular problems encountered in this category of dogs, resulting from poor phosphorus and calcium intake. Calcium and phosphorus are usually discussed together due to their metabolism and homeostatic mechanism (Case et al., 2011). Calcium is the main bone inorganic component, which in bone tissue is not in a static state, but is constantly mobilized and stored to ensure the need for growing bone and its maintenance.

Plasma calcium levels are strictly controlled by the homeostatic mechanism and are independent of calcium intake in the animal's diet. Circulating calcium has an essential role in the transmission of the nerve impulse, in muscle contraction, in blood coagulation, in the activity of enzymatic systems, in maintaining the permeability of cell membranes, in their transport and in cardiac function. Phosphorus is also an important component of bones. About 85% of an organism's phosphorus is found in combination with calcium in the structure of bones and teeth. Most of the remaining residue is found in the soft tissue, along with the organic substances. Phosphorus in soft tissues has a large number of functions and is involved in almost all metabolic processes in the body. It is a constituent of cellular deoxyribonucleic acid (DNA), ribonucleic acid and some vitamin B coenzymes. The balance between calcium and phosphorus intake is important in terms of diet (DiBartola, 2012). Excess calcium forms an insoluble phosphorus complex and results in low phosphorus absorption. Similarly, high levels of phosphorus in the animal's diet may inhibit calcium absorption.

The recommended ratio of calcium and phosphorus in dog and cat food is between 1:1 and 2:1. Dietary calcium deficiency can be caused by meat-based diets, home-cooked foods that are low in calcium salts, unbalanced commercial foods, or poor-quality diets that contain excess phytates (Fascetti and Delaney, 2012). On the other hand, an increased calcium intake will cause the hyperplasia of C cells, responsible for the production of calcitonin, consequently there will be an increase in the calcitonin response and calcium absorption will be higher, even a few months after the normalization of calcium intake. In pets, phosphorus deficiency is very rare, only in extreme cases can a relative deficiency occur. Hypophosphatemia causes an imbalance in bone mineralization and radiologically there will be enlarged growth plates and a thinning of the cortex.

MATERIAL AND METHOD

The cases were represented by 8 dogs of different sexes (4 males and 4 females), ages (between 4 weeks and 24 months) and breeds. All cases presented movement difficulties, the tendency of the forelimbs of the forelimbs to deviate outwards, the fingers to spread, the growth joints to thicken, the bones to bend. All dogs needed guidance regarding food and its supplementation, to avoid the appearance of rickets, panosteitis or other osteo-articular diseases.

Among the recommended nutritional supplements, several products available on the market were used, as follows: Fortan Cafortan® for young

dogs with difficulties in assimilating vitamins and minerals, reports Ca: P of 2: 1, vegetable fats, vitamins and minerals, amino acids and peptones, crude protein - 39%, crude fat 4.3%, crude fiber 1.7%, crude ash 20.7%, calcium 4.49%, phosphorus 2.2%, potassium 2%, magnesium 1%. Another product, Pet Phos Croissance Ca/P=2 Grand Chien ®, ideal for medium to large breed dogs, contains elements necessary for bone mineralization, such as calcium, phosphorus, vitamin D, iodine and manganese. The Ca/P ratio is 2. K-9 Complete Growth® has the active ingredients/tablet are as follows: Calcium carbonate 600 mg, Magnesium (chelated amino acid) 300 mg, Phosphorus 300 mg, Vitamin A acetate 750 I.U., Vitamin D3 75 I.U., Vitamin C 10 mg, Vitamin E 2 I.U. Calcitabs © - tablets with calcium and phosphorus, used for the prevention of rickets, osteomalacia, disorders of calcium metabolism. It can also be used curatively in conditions such as rickets, osteomalacia or in the treatment of bone fractures. Chemical composition: Calcium: 20.0%, Phosphorus: 6.0%, Sodium: 0.1%, milk powder, sugar, yeast.

In the case of large dogs in the breeding period, food is an important factor that, in addition to genetics and the environment in which the dog grows, influences health and ensures the proper development of the skeleton. Nowadays, the diversity of dog food is very large and constantly growing. The products are varied and are created especially according to age, waist and race.

In order to find the right food for large dogs in the breeding period, it must be taken into account that the percentage of protein is a maximum of 30%. An increased percentage of protein is not recommended, because then the body's tendency will be towards fattening, and it will be more difficult for the skeleton to support its weight.

The food of a large dog, per day, will be divided into two meals, one in the morning, one in the evening, because these huge breeds are prone to gastric torsion.

Some retailers have managed to adapt the food for the maxi category, both for Maxi Baby and for Maxi Junior. Maxi Baby is recommended for large dogs aged between 4 weeks and 5 months. The protein content is 29%. Maxi Junior has a low protein content, only 23% and is administered to dogs aged between 5 and 18 months. The advantage is that this food can be offered to dogs depending on the stage of change of dentition. In the first stage of feeding the calcium is 1.25%, and in the second it is 1.2%. In both stages, vitamin D3 is 1200 I.U. The phosphorus remains at a percentage of 0.8% for both stages of feeding. Many veterinarians recommend this food, due to its superior quality and good results.

The clinical examination consisted of static and moving inspection of the examined dogs. The inspection in static position was followed by the conformation and constitution of the dog, the parallelism of the forelegs and hind limbs, the aplomb, any change in body shape, dentition and height, respectively the size of the animal relative to the growth chart of the examined breed. In motion, the way the dog drives his limbs was followed. When we encounter bone problems due to calcium and vitamin D deficiency, the patient may have lameness of varying degrees, difficulty and pain while traveling.

Paraclinical examination consisted in blood sampling followed by biochemical examination. The place of choice for harvesting was the cephalic vein, from the forearm region. Biochemical determinations were performed in 3 dogs and serum calcium and phosphorus were monitored. The determinations were performed by the mean of spectrophotometer Screen Master Touch UV/Vis. The reagents necessary for the dosing of the required parameters are purchased from Hospitex Italia. Calcium was determined by the colorimetric method and phosphorus by the enzymatic method, in the UV domain.

RESULTS AND DISCUSSION

Case no. 1, the female Cane Corso, 7.5 months old, showing curvature of the bone rays, deviation of the aplomb line of the forelimbs, discomfort in movement. The fingers of the limbs, both anterior and posterior, were spread.

Case no. 2, a 2.5-month-old male Cane Corso, with the left foreleg deviated from the aplomb line.

Case no. 3, represented by a 6.5-month-old male Corso Dog, with a thickened bullet joint and the fingers of the forelimbs spread out. In this case, the biochemistry examination resulted: As serum: 5.9 mg / dl and serum P: 3.21 mg / dl.

Case no. 4 is represented by a 16-month-old Corso Dog, with no difficulty in moving, but both aplomb lines of the forelegs deviated, and the joint of the bullet, despite its age, remained slightly thickened and deflected outwards, fingers spread.

Case no. 5, a 6-week-old female Tchiorny Terrier had a deviation of the left anterior limb from the outward joint of the bullet.

Case no. 6, a 4-week-old female Tchiorny Terrier, without difficulty in movement, but with a thickened bullet joint, and the left foreleg left deflected outwards.

Case no.7, represented by a 18-month-old Argentine Dog, had the rear train modified, had difficulty moving. Biochemical results: Ca serum

11.95 mg / dl and serum P: 5.3 mg/dl. Following the cures with nutritional supplements and injectable vitamin D2 and the best quality food, the dog did not show any improvement in the appearance of the rear train, the hocks being close, in "X", and the groove chamfered.

Case no. 8 was represented by a German Dog, aged 3 months and 12 days, with the forelimbs thickened at the bullet joint, and from this joint down the limb was deflected outwards.

Following the administration of a Super Premium food, in addition to which the vitamin-mineral intake was supplemented by the administration of the vitamin complex Fortan Cafortan, within 2 months there was an improvement in the appearance of the forelimbs, straightening the aplomb line, narrowing the fingers and returning the harmonious movement, in cases numbered 5 and 6, represented by two female specimens, of the Tchiorny Terrier breed. The Tchiorny Terrier breed responds very well to the administration of Fortan Cafortan, starting with the 3rd month of life, immediately after the tooth change process begins. The administration of vitamin D3 subcutaneously, once every 21 days, starting with the 4th month of life and feeding with commercial food Happy Dog, Supreme Baby Maxi, stage 1 and 2 are the appropriate formulas to which this breed responds very well.

In the biochemical determinations performed, the modification of the monitored parameters was found, namely serum calcium and phosphorus. Serum calcium values ranged from 5.9-11.95 mg / dl, modified from normal values (9-11 mg/dl). Phosphorus was in normal values, between 3.21-5.3 mg / dl, having as reference values 2.5-6 mg / dl.

A study conducted on a group of German Dog during the growing period, which was given a food containing 3.3% calcium, revealed the curvature of the radius (Hov et al. 1994). The same experiment was performed on 3 groups of different ages (LaFond et al., 2000). Thus, a food with a calcium content of 3.3% was administered to a group from the age of 3 weeks to 6 weeks. At the age of 4 months, panosteitis was observed. The group from the age of 3-17 weeks was affected by hypophosphatemic rickets, and in the one between the ages of 6-26 weeks there was severe osteochondrosis and radius curvature.

CONCLUSIONS

Clinical examination showed that each specimen, during the growing period, which did not receive age-appropriate nutritional supplements and did not receive proper nutrition, showed changes in the joint, changes in the long bones rays, deviation of the limbs from the correct line of aplomb, finger spread, due to vitamin deficiency and difficulty in movement.

As an important and noteworthy remark, is that these dogs, of large breeds, in the breeding period, it is recommended to establish a vitamin-mineral treatment plan to support the young body and to be complementary to a Super Premium food,

A different response was observed to the administration of vitamin-mineral supplements depending on the race, requiring strict compliance with the protocol for their administration.

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DROWNING CHILD. PREVENTION STRATEGIES

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Abstract

Drowning is a major public health problem worldwide, being a leading cause of death and disability among children. There are a series of risk factors favoring drowning and pediatricians can play an important role in preventing those factors. In order to determine the effectiveness of the first aid intervention in drowning children, the authors conducted a research which included 86 patients with a diagnosis of drowning, focusing on demographic data, circumstances of drowning, clinical aspects, treatment, outcome, complications, prognosis, sequalae. Rates of drowning varied with age, gender, location, socio-economic background, level of adult supervision, seasons, certain medical conditions, swimming abilities, use of protective equipment. The highest rate of drowning was in children older than 5 years, males being at greater risk. Age is an important determinant of drowning locationPrevention is very important because if applied correctly it will save children's lives.A series of preventive measures against drowning in children are reviewed in this paper.

Key words: drowning, child, prevention strategies

INTRODUCTION

Drowning is a major public health problem worldwide, ranking third as the leading cause of death from unintentional injury, accounting for 7% of all trauma deaths.It is also a leading cause of death and disability among children. Socio-economic status also plays an important role, with most such accidents affecting children in lower middle-income countries. The site of drowning varies with age, being represented by bathtubs, water buckets, pits, ponds, canals, water tanks, wells, swimming pools, running water, lakes, seas and oceans.Risk factors that favor drowning are the lack of a closer surveillance of infants and young children, inappropriate safety measures around pools or open bodies of water, poor swimming skills, educational deficits (lack of awareness about the risk of drowning), physical or neuro-psychiatric disorders, substance abuse (alcohol or drugs), water transportation, natural disasters (floods).[1]Various strategies are available to prevent these tragedies. As educators and advocates for children's interests, pediatricians can play an important role in preventing drowning, helping them and their parents to become aware of the dangers that water can pose in different situations and at different ages.[2]

MATERIAL AND METHODS

In order to determine the effectiveness of the first aid intervention in drowning children, we conducted a clinical, retrospective and comparative study, which included 86 patients with a diagnosis of drowning, which were divided into 62 deceased children and 24 surviving pediatric patients during January 2002 and December 2017. A Case Report Form was filled for each patient, containing the following data: demographic data, circumstances of drowning, clinical aspects, treatment, outcome, complications, prognosis, sequalae. After the inclusion of patients in the research group, the study protocol comprised an evaluation of patients based on patients' files, including statistical and descriptive analysis of data and finally interpretation and comparison of statistical results obtained.

RESULTS AND DISCUSSIONS

Rates of drowning varied with age, gender, location, socio-economic background, level of adult supervision, seasons, certain medical conditions, swimming abilities, use of protective equipment.

The highest rate of drowning was in children older than 5 years, males being at greater risk. Among drowning victimsyounger than 15 years, two-thirds ofdeaths occurred from May through August, more than half happening on the weekend (52.6%).Of total 86 drownings, 73.25% occurredin fresh bodies of water (rivers,creeks, lakes, ponds, canals, quarries),11.62% occurred in artificial pools,and 15.11% occurred in the home (bathtubs,buckets).Age is an important determinantof drowning location. Most cases of drowning were recorded in rural areas (62.79%), the highest frequency having accidents while bathing and involving an unsupervised child (59.30%). Better swimming ability,as reported by the parents, was associatedwith lower drowning risk; most drowned children in our research did not have swimming skills(66.7%). Behavioral disorders were present in 38.37% of the cases, 15.12% of children were suffering from underlying somatic chronic medical conditions, while in 8.14% drownings alcohol or drug abuse was recorded.

Making these observations in our research, we consider that it is of great importance to implement certain preventive measures against drowning in children, methods that are reviewed hereinafter.

DROWNING PREVENTION METHODS

Surveillance of young children around any accumulation of water is an essential preventive strategy, but possible negligence, lack of attention, sometimes inevitable, make just the supervision itself, insufficient.

Installingprotective fences around the pools and the presence of lifeguards in the swimming pools area can protect children and young people from drowning. Other strategies include teaching children to learn survival techniques suitable for swimming; informing parents and caregiver about the importance of close supervision of children who are engaged in water activities; stressing the need to wear life jackets while sailing; discouraging alcohol or drug consumption among adolescents while participating in water activities;learning and mastering first aid and cardio-respiratory resuscitation techniques. Experts recommend that more layers of protection be considered to prevent drowning, as applying a single strategy is unlikely to prevent trauma and drowning. [3]

Constant close supervision

To reduce the number of deaths by drowning among children, the most effective method is to prevent unintentional and unsupervised access to water. Whenever the child is in or near the water, it is essential to be constantly monitored. To avoid a tragedy, it is very important not to engage in other activities that could distract from the child's supervision, such as using a cell phone, working in the yard, or drinking alcohol[1],[5].The recommendations of the American Academy of Pediatrics are that, when spending time in or near water, one adult supervisor should constantly maintain close contact ("touch supervision") with the child. Ensuring careful and constant surveillance in and around the water is necessary even if there is a lifeguard nearby. Whenever it is decided to stop activities in the water, it is important not to leave the child alone in the water, even if lifeguards are also present. [6],[4]

According to statistics, 19% of drowning deaths in children occurred in public places with certified lifeguards present at the scene. However, professionally trained lifeguards have had a positive effect in preventing drowning in the United States, including avoiding dangerous behaviors by assessing potentially risky situations. Children often drown quickly and cannot draw attention to themselves when they are in extreme situations. Such cases occur in overcrowded pools, lakes, parks, beaches, so that the assignment of additional tasks to lifeguards leads to a decrease in their efficiency. In order to avoid undesirable events, the competent authorities have decided to install warning signs with the message "No bathing, danger of drowning". So, the recommendation is to take a bath only in specially designated swim sites. Most of the time, just following the rules can save our lives.[7]

Learning swimming skills

Swimming lessons for all children and even for their parents / guardians, are a very effective way to prevent drowning and give both parties safety in or near water. Recent studies show that training in water survival skills and swimming lessons can help reduce the risk of drowning for all children, including those aged 1 to 4 years. When deciding to start swimming lessons, it is recommended to take into account a variety of individual factors, including the child's emotional maturity, how often the child can be around the water, his physical and developmental skills, how comfortable he feels in the water, but also his interest in learning to swim. The pediatrician, along with a psychiatrist or psychologist, can outline a psychological profile of the child that provides valuable information about these essentials. Children should be encouraged to learn to swim, but these lessons should not give parents a false sense of security. Baby water accommodation programs do not prevent submersion injuries and are potentially dangerous because they give parents a false sense of security if they think the baby can swim.[8], [11]

Also, all individuals involved in watercraft activities should know how to swim, should use special protective equipment when on the boat, should avoid the use of alcohol and recreational drugs, especially in the presence of children who they must be constantly monitored.Children under the age of 14 should not ride personal watercraft without being supervised by an adult. In 2002, more than 189 children under the age of 14 had accidents with personal watercraft.[12], [13], [14]In 2000, only a third of children in this age group wore life-saving and protective equipment. Since 2009, 38 states have adopted navigation safety regulations, requiring children to wear authorized protective equipment at all times while on boats or in high water.[15], [16]All children should be taught to swim in company, to check for danger warnings and to carefully check the depth of the water and the presence of possible dangerous objects before diving into the water; they must know their swimming limits, and to avoid playing dangerously in areas with natural water accumulations, in pools or on decks around swimming pools.[17]Another strategy that would have a significant impact on children is to teach basic swimming and rescue skills safely in kindergartens and schools.A 2009 batch clinical trial concluded that participation in formal swimming lessons reduced the risk of drowning by 80%. Parents should be informed about the objectives, limitations, methods and purpose of these courses for their children.[20], [21], [22]

Establishing protective barriers to keep the child safe

Research suggests that restricting access to water can prevent more than half of all drowning deaths among children. 69% of drownings in children under 4 years of age occur as a consequence of events unrelated to swimming or organized activities in the water.[23] Pools, including large, above-ground inflatable pools and other temporary pools, should be completely surrounded by a fence on all 4 sides.[24] Thus, the recommendation is to mount a fence with a suitable height, without any opening under it or between the plates, which does not allow climbing, having a gate with automatic closing and self-locking that opens outside the pool. The gate must also be permanently locked and checked frequently for the safety of its functionality.[25], [26], [27], [28]

Equally important in eliminating the risk of drowning is to keep inflatable toys / items out of the pool area when not in use, so that children are not tempted to try to reach them while they are not properly equipped for swimmingor how long they are unattended.[29]For the full safety of the child, it is essential to always cover and enclose / delimit wells, wells, ponds, swamps, water pits, septic tanks, any place with water that could endanger the child's life. Even filled and open water containers must be carefully monitored, and when not in use, all liquids in them (tub, bucket, barrel, etc.) must be completely emptied.[30]

The bathroom can be a risky place for children because they can spill their heads in the toilet bowls or in the full bathtubs, or they can be flushed with too hot water. The installation of locking devices for toilet lids, as well as the removal of the drain plug of the tub when not in use, can be considered additional methods of protection, thus avoiding filling the tub if the child turns on water unintentionally.[23], [30], [31]

Supervision of the child during the bath is essential, so he should never be left alone in the bathtub or in the care of another child. Since 1983, there have been at least 104 deaths and 126 non-fatal drownings in the United States involving improperly supervised bathing chairs.[32]

Use of life jackets or personal floatation devices (PFDS)

Whether or not the child has minimal knowledge of swimming, he should always wear life jackets / personal floatation devices when in or around the water. These drowning preventing devices must be properly fitted and suitable for each child. Exceptions to wearing this equipment are children who are specially trained and prepared for this sport, but even so, the supervision of a parent / person is important given the unpredictability of children.[33]

CONCLUSIONS

Drowning is a public health problem with a significant impact on children, which is an unpleasant experience because children have to swallow water for a few seconds, most children being left with neurological and other sequelae.Prevention is very important because if applied correctly it will save children's lives.

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EQUATIONS AS A BASIS FOR FEED PROTEIN QUALITY EVALUATION FROM AMINO ACID ANALYSIS

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Abstract

The aim of the research was to establish the amino acid profile of proteins in white lupine beans from low alkaloid varieties and their nutritional evaluation, as an alternative to proteins from soy products and by-products. The amino acid composition of the proteins in the analyzed lupine samples showed that lupine is a good source of lysine (5.2 - 6.3 g / 16 g N), but is deficient in other essential amino acids, especially sulfur amino acids (methionine + cystine: 2.0 - 2.4 g / 100 g protein) and tryptophan. This is confirmed by the high value of CS_{Lys} (85.28%), and sulfur amino acids were limiting amino acids ($CS_{Met + Cys}$: 38.07%), when egg protein was used as a standard. Similar aspects were found when used as standard, the nutritional requirements of the adult human, the nutritional requirements of broilers or the nutritional requirements of fattening pigs. Regardless of the standard used, in all cases mentioned Met + Cys were limiting amino acids. According to the data obtained in this study, it can be concluded that white lupine grains are rather a good source of protein for feeding broilers (EAAI is 107.49%, CS_{Lys} is 127.00 and P-BV is 105.46). The protein in lupine grains covers to a lesser extent the nutritional requirements of essential amino acids for the diet of mature man (EAAI in proportion of 89.01; and P-BV 85.32) but also for young animals especially for fattening pigs. (20-50 kg), because it is deficient in essential amino acids, this fact being expressed by the low values of the analyzed nutritional indices.

Key words: essential amino acids, protein standard, limiting amino acids, EAAI, CS_{Lys}

INTRODUCTION

It is well known that the feeding of birds in an intensive system is dependent on conventional protein sources, respectively soybean meal which has a high protein content (42-46%) with a balance of essential amino acids close to the nutritional requirements of birds. However, in the context of the ban on animal meal in poultry feed, the ban on the cultivation of genetically modified plants (soy) and the tendency to limit the use of genetically modified soy products and by-products, it is necessary to evaluate unconventional sources of protein with good biological value. which can be available locally and at the same time be economical. Thus, alkaloid-free white lupine berries are a promising alternative.

Many authors consider that white lupine is a valuable source of cheap protein for animal feed (Podleśna et al., 2014) and is a suitable crop not only in Romania but also in other European countries (Mierliță, 2012; Voisin et

al., 2014; Faligowska and Szukała 2015, Reckling et al., 2016), because they have low requirements for soil and climate and leave the land relatively quickly, making it possible to prepare the land for the establishment of autumn crops. The data from the literature mention that the improved varieties of white lupine produce 3500-4800 kg of grains / ha, contain 31-43% protein and 6-11% fat (depending on climatic conditions), but the lower biological value of the protein is underlined. from lupine compared to soy (Nalle et al., 2010).

The aim of the research was to establish the amino acid profile of proteins in white lupine beans from low alkaloid varieties and their nutritional evaluation, as an alternative to proteins from soy products and by-products.

MATERIALS AND METHODS

The amino acid content of lupine grain proteins was determined using an automatic amino acid analyzer type Biochrom 20 Plus and complying with the current standard PN-EN ISO 13903: 2006. Prior to analysis, the samples were hydrolyzed in 6 M HCl at 110 ^{0}C for 24 hours under a nitrogen atmosphere, according to the method described by Sobotka et al. (2016). Cystine and methionine were determined as cysteic acid and methionine sulfonate, respectively, after oxidation of the sample with performic acid for 16 hours at 0 ^{0}C and neutralization with hydrobromic acid before hydrolysis with 6 M HCl at 110 ^{0}C for 24 h was determined after hydrolysis of the sample with NaOH at 110 ^{0}C for 16 h, according to the current standard PN-EN ISO 13904: 2005. All analyzes were performed in four repetitions. The amount of amino acids was expressed in g / 16 g N, equivalent to g / 100 g of protein (FAO / WHO, 1991).

The nutritional quality of lupine grain proteins was estimated based on (Mierliță et al., 2018):
- total amino acid (AA) content;
- protein content in essential amino acids (EAA);
- EAAI (essential amino acid index), using as a standard egg protein (NRC, 1989), the nutritional requirements of 6-8 week old broilers (NRC, 1994), the nutritional requirements of meat pigs weighing 20-50 kg (Boisen et al., 2000) and the nutritional requirements of the adult human (FAO / WHO 1991);
- chemical score for limiting amino acids (CS_{Lys} - lysine chemical score; $CS_{Met + Cys}$ - methionine + cysteine chemical score);
- expected protein efficiency ratio (P-PER: Predicted-Protein Efficiency Ratio);
- predicted biological value (P-BV: Predicted-Biological Value);

• nutritional index.

EAAI (Essential Amino Acids Index) was calculated as the geometric mean of all participating essential amino acid concentrations (EAA) compared to the concentration of an appropriate standard (in g/16 g N) according to the following formula (Oser, 1959):

$$EAAI = \sqrt[n]{\left(\frac{a_1}{a_{1s}}\right) \times 100 \times \dots\dots\dots \times \left(\frac{a_n}{a_{ns}}\right) \times 100},$$

where a1… an, is the AA content of the tested protein and a1s… .ans is the AA content of the reference protein; n is the number of essential amino acids considered.

CS (chemical score) values were calculated for lysine and methionine + cystine, respectively, according to the following formula (Block and Mitchell, 1946):

$$CS = {a_n}/{a_{ns}} \times 100$$

where an is the AA content of the tested protein and ans is the AA content of the reference protein.

The Predicted-Protein Efficiency Ratio (P-PER) was calculated according to the equations developed by Alsmeyer et al. (1974):

$$P\text{-}PER = 0.06320 \, [X_{10}] - 0.1539$$

where: $X_{10} = Thr + Val + Met + Ile + Leu + Phe + Lys + His + Arg + Tyr$

The Predicted Biological Value (PMV) was calculated according to the methods of Oser (1959). The following equation was used to determine P-BV:

$$P\text{-}BV = 1,09 \, (EAAI) - 11,7.$$

The nutritional index (NI) of lupine grain proteins was calculated using the mathematical relationship proposed by Crisan and Sands (1978):

$$NI \, (\%) = \frac{EAAI \times \% \text{ proteină brută}}{100}$$

RESULTS AND DISCUSSION

The amino acid composition of the proteins in the analyzed lupine samples, expressed in g/16 g N, equivalent to g/100 g protein, is shown in Table 1. Table 2 shows the nutritional value of the proteins in lupine grains assessed on the basis of standards. presented in Table 3.

In general, lupine grains are a good source of lysine (5.2 - 6.3 g / 16 g N), but are deficient in other essential amino acids, especially sulfur amino acids (methionine + cystine: 2, 0 - 2.4 g / 100 g protein) and tryptophan (Fig. 1).

Table 1

Amino acid content of white lupine protein (g / 16 gN)

	Own results			Bibliographical references*		
	Media	(Min - Max)	SD	1	2	3
Essential AA						
Lysine	**5,97**	(5,21 - 6,37)	0,181	5,80	5,10	6,11
Methionine + Cystine	**2,17**	(2,02 - 2,46)	0,094	2,80	2,50	2,19
Arginine	**8,28**	(7,31 - 9,11)	0,209	8,96	11,1	9,89
Treonine	**3,72**	(3,41 - 3,92)	0,174	3,83	3,10	3,68
Izoleucine	**3,67**	(2,87 - 4,51)	0,161	3,06	4,10	4,39
Tryptophan	**0,84**	(0,75 - 0,89)	0,037	0,65	0,70	0,95
Valine	**4,03**	(3,47 - 5,09)	0,195	3,57	3,80	4,23
Leucine	**5,74**	(5,38 - 6,41)	0,254	7,20	8,20	6,18
Histidine	**2,40**	(2,18 - 2,69)	0,112	2,71	3,10	2,31
Phenylalanine+Tyrosine	**7,49**	(6,76 - 8,24)	0,275	6,12	5,50	8,09
Non-essential AA						
Aspartic acid	**10,56**	(9,40 - 11,67)	0,491	12,20	9,90	10,17
Serine	**5,19**	(4,72 - 5,84)	0,207	5,60	4,10	5,12
Glutamic acid	**21,31**	(19,15 - 23,4)	0,518	18,54	24,20	23,37
Proline	**3,87**	(3,21 - 4,15)	0,142	3,74	3,80	4,19
Glicine	**3,96**	(3,46 - 4,81)	0,196	3,83	4,30	4,17
Alanine	**3,49**	(2,78 - 4,11)	0,132	3,71	3,10	3,50
Tyrosine	**3,61**	(3,02 - 4,26)	0,097	2,79	1,50	3,98
Cystine	**1,45**	(1,15 - 1,92)	0,088	1,12	1,80	1,49

* 1- Grela et al., 2017; 2 - Sujak et al., 2006; 3 - Mierliță et al., 2018.

The available literature shows a high proportion of lysine and a relatively low level of amino acids with sulfur and tryptophan in white lupine grains (Brenes et al., 2005; Sujak et al., 2006; Zraly et al., 2007; Pisarikova et al. , 2008; Grela et al., 2017; Mierliță et al., 2018). This was largely confirmed by the present results, as the CS_{Lys} value for the proteins in the lupine grains analyzed was high (85.28%) and the sulfur amino acids were limiting amino acids ($CS_{Met + Cys}$: 38.07%), when egg protein was used

as a standard (NRC, 1989). Similar aspects were found when used as a standard, the nutritional requirements of adult humans (FAO / WHO 1991), the nutritional requirements of broilers (NRC 1994) or the nutritional requirements of fattening pigs (Boisen et al. 2000) (Table 2). Regardless of the standard used, in all cases mentioned Met + Cys were limiting amino acids. Therefore, alkaloid-free white lupine grains should be combined with methionine-rich foods or feeds or supplemented with synthetic methionine (Kotlarz et al., 2011). Similar aspects were recorded in studies conducted by other authors, in the white lupine of the Amiga variety (Mierliță et al., 2018) and in the white lupine of other varieties cultivated in Europe (Sujak et al., 2006 - in the cultivated Boros variety in Poland; Grela et al., 2017 - in the Bhutan variety, cultivated in the Czech Republic).
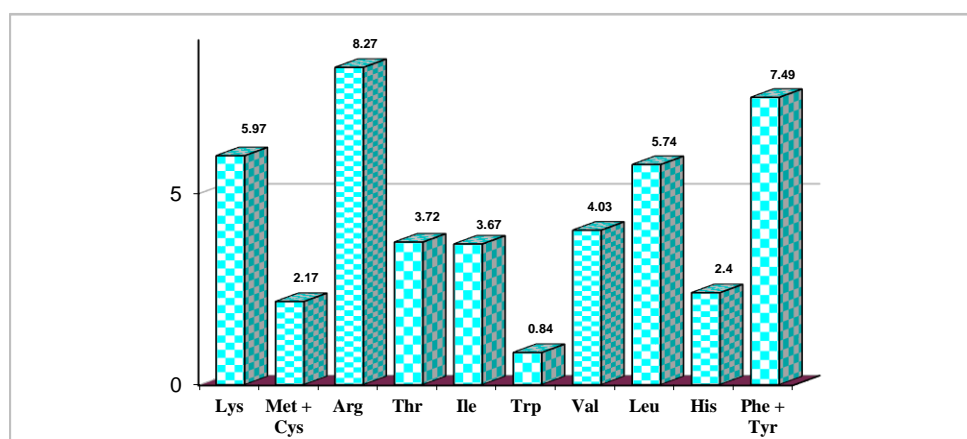
Fig. 1. Essential amino acid content of lupine grain proteins (g/16 g N).

Comparing the amino acid content of lupine grains proteins obtained in the agro-climatic conditions in Transylvania, with the data provided by other researchers, we find some differences that may be due on the one hand, the dosing methods used and on the other hand due to the conditions meteorological (humidity, temperature), soil type, agrotechnics used and last but not least, the variety used. Larger differences were found in the content of arginine, leucine and phenylalanine + tyrosine.

Protein from white lupine grains has a lower biological value than animal protein. This was confirmed in the present study by the lower content of essential amino acids (EAA), which was 36.03 g / 16 g N (Table 2), compared to the value of 51.2 g / 16 g N in chicken egg white used in evaluating the quality of lupine proteins as a standard (Hidvegi and Bekes, 1984). The results obtained in this study confirm the data previously obtained in other studies (Sujak et al., 2006; Grela et al., 2017; Mierliță et

al., 2018), in which the EAA content in white lupine grains of different varieties, a ranging from 35.74 to 38.13 g / 16 g N.

The expected biological value (P-VB) of lupine grain proteins was 62.19 in our study, while in the literature are cited values between 61.00 and 66.46 (Table 2), which confirms and strengthens the results obtained in this study.

Table 2

Nutritional characterization of proteins from white lupine grains

	Own results	Bibliographical references*		
		1	2	3
Total AA (g/16 g N)	**92,68**	91,32	98,54	96,60
Standard[1]				
EAA (g/16 g N)	**36,03**	35,74	38,13	36,10
CS_{Lys}	**85,28**	82,85	87,28	72,86
$CS_{Met+CYS}$	**38,07**	39,12	38,42	43,86
EAAI (%)	**67,79**	66,70	71,71	67,55
P-BV	**62,19**	61,00	66,46	61,92
IN (%)	**24,67**	24,27	26,11	24,58
Standard[2]				
EAA (g/16 g N)	**33,63**	33,03	35,82	33,00
CS_{Lys}	**108,54**	105,45	111,09	92,72
$CS_{Met+CYS}$	**62,00**	80,00	62,57	71,43
EAAI (%)	**89,01**	85,91	94,98	85,86
P-BV	**85,32**	81,94	91,82	81,88
IN (%)	**32,40**	31,27	34,58	31,25
Standard[3]				
EAA (g/16 g N)	**36,03**	35,74	38,13	36,10
CS_{Lys}	**127,02**	123,40	130,0	108,51
$CS_{Met+CYS}$	**65,76**	84,84	66,36	75,75
EAAI (%)	**107,49**	105,43	113,44	107,14
P-BV	**105,46**	103,21	111,95	105,08
IN (%)	**39,12**	38,37	41,30	39,00
Standard[4]				
EAA (g/16 g N)	**36,03**	35,74	38,13	36,10
CS_{Lys}	**85,28**	82,85	87,28	72,86
$CS_{Met+CYS}$	**60,28**	77,78	60,83	69,44
EAAI (%)	**79,89**	78,57	84,45	79,69
P-BV	**75,38**	73,94	80,35	75,16
IN (%)	**29,07**	28,60	30,75	29,00
P-PER	**2,55**	2,60	2,73	2,71

EAA - total essential AA; CS - chemical score; EAAI - index of essential AA; P-BV - predicted biological value; P-PER - predicted protein efficiency ratio.
Standard[1] - egg protein (NRC, 1989),
Standard[2] - standard based on adult nutritional requirements (FAO / WHO 1991)
Standard[3] - standard based on the nutritional requirements of broilers, 6-8 weeks (NRC, 1994)

Standard[4] - standard based on the nutritional requirements of fattening pigs (20-50 kg) (Boisen et al., 2000)

* 1- data processed after Grela et al., 2017; 2 - Mierliță et al., 2018; 3 - data processed according to Sujak et al., 2006.

The nutritional index (IN) of lupine grain proteins, calculated as a percentage of the product between the crude protein content and the protein content of essential amino acids, was 24.67, according to data obtained in other studies (Sujak et al., 2006; Grela et al., 2017).

The expected nutritional values for white lupine protein (EAA, CS_{Lys}, $CS_{Met + Cys}$, EAAI, P-BV and IN) were calculated using egg protein as a standard but also based on standards for nutritional requirements for broilers (NRC, 1994); those related to the nutrient requirement for mature man (FAO / WHO 1991) and nutritional requirements for fattening pigs weighing 20-50 kg (Boisen et al. 2000) (Table 3). The values recorded in this study regarding the nutritional value of lupine protein, respectively the value for EAAI, CS_{Lys}, $CS_{Met + Cys}$, P-BV and IN, were comparable to those cited in the literature, which mentions numerous studies conducted in different pedoclimatic areas in Europe and in which different varieties of white lupine free of alkaloids have been studied (Sujak et al., 2006; Grela et al., 2017; Mierliță et al., 2018) (fig. 2). It should be noted that in most situations, especially the value of $CS_{Met + Cys}$ was at the lower limit of its range of variation, mentioned in other studies.

Table 3

Standards used to evaluate lupine seeds proteins

Standards used	Amount of essential AA (g/16 gN)									EAA (g/16 gN)
	Lys	Met + Cys	Thr	Ile	Trp	Val	Leu	His	Phe + Tyr	
Egg proteins (NRC, 1989)	7,0	5,7	4,7	5,4	1,7	6,6	8,6	2,2	9,3	51,2
Nutritional requirements for adults (FAO/WHO, 1991)	5,5	3,5	4,0	4,0	1,0	5,0	7,0	-	6,0	36,0
Nutritional requirements for broilers (NRC, 1994)	4,7	3,3	3,8	3,4	0,9	3,9	5,2	1,5	5,8	32,5
Nutritional requirements for pigs 20-50 kg (Boisen et al., 2000)	7,0	3,6	4,5	4,0	1,2	5,2	8,0	2,5	8,0	44,0

According to the data obtained in this study, using the standards mentioned above (nutritional requirements for humans, broilers and fattening pigs), it can be concluded that white lupine grains are rather a good source of protein for feeding chickens (EAAI is 107.49%, CS_{Lys} is 127.00 and P-BV is 105.46) (Fig. 3).
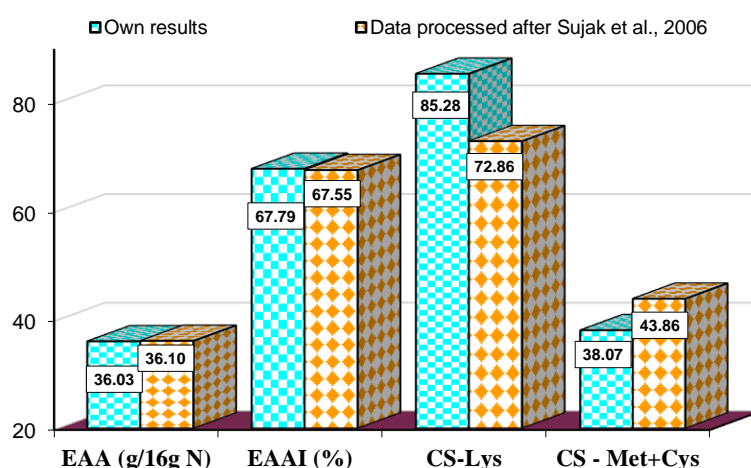

Fig. 2. The value of quality nutritional indices of lupine proteins, using egg proteins as standard (NRC, 1989).
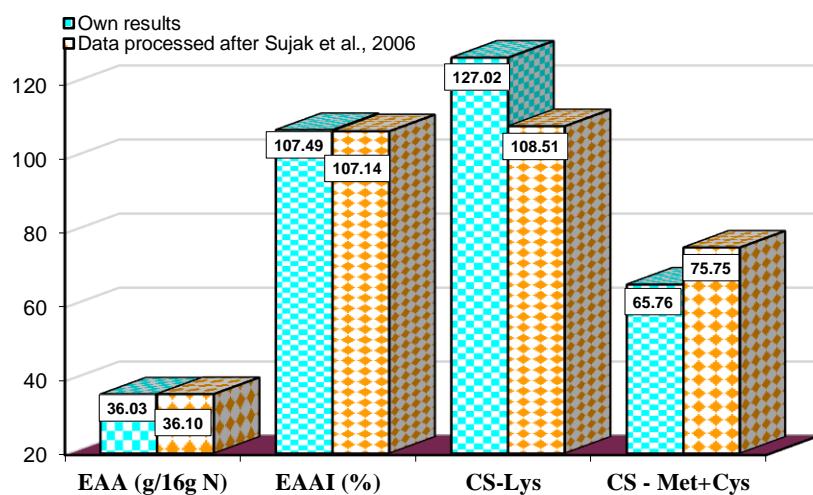

Fig. 3. The value of quality nutritional indices of lupine proteins, using as standard the nutritional requirements of broilers (NRC, 1994).

The protein in lupine grains covers to a lesser extent the nutritional requirements of essential amino acids for the diet of mature man (EAAI in proportion of 89.01; and P-BV 85.32) but also for young animals especially for fattening pigs. (20-50 kg), because it is deficient in the content of essential amino acids, this fact being expressed by the lower indices of EAAI (79.89%); CSLys (85.28); CSMet + Cys (60.28); P-BV (75.38) and IN (29.07).

From a nutritional point of view, food proteins have a good nutritional value when the index of essential amino acids (EAAI) is> 70.0%; the protein efficiency ratio (PER) is >2.7; expected biological value (P-BV) is> 70% (Ijarotimi et al., 2015).

CONCLUSIONS

The results obtained in this study, respectively the values recorded for EAAI, PER and P-BV, showed that white lupine from low alkaloid varieties contains proteins of appreciable quality, but still they cannot be used as the only source of protein for animal nutrition must be combined with feeds whose proteins have a higher biological value, but also with feeds that have a higher content of sulfur amino acids.

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EFFECT OF MILK AND XANTHAN AS AN EGG SUBSTITUTOR ON THE PHYSICAL PROPERTIES OF MAYONNAISE

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Abstract

This paper compares the rheological and physical properties of conventional mayonnaise and mayonnaise with combinations of whole-milk and the decrease or removal (partial or total) of the egg.

The objectives we pursued in this paper were: analysis of the growth/cremation index of mayonnaise; analysis of heat stability of mayonnaise; analysis of the physical stability of mayonnaise; analysis of the variation of the apparent viscosity of mayonnaise depending on the temperature and shear rate; quantification of the size of the parameters of the Casson mathematical model affected by the state variables: the concentration and ingredients of mayonnaise.

All samples show the same shear force, regardless of the formula used, under conditions of a constant shear rate.

All samples of mayonnaise, regardless of the formula used, are non-Newtonian time-dependent liquids, thixotropic, which suffers a decrease in viscosity, with the change in the concentration of ingredients (egg, milk, xanthan) at a constant shear rate.

For all mayonnaise samples, the relationship between shear stress and shear rate was nonlinear, showing a behavior of thinning shear (pseudoplastic liquids).

Key words: mayonnaise, Casson mathematical model, rheological and physical properties.

INTRODUCTION

Mayonnaise is an oil-in-water emulsion prepared from vegetable oil, egg yolk, vinegar, sugar, salt, mustard and a variety of food additives (Juszczak et al. 2003). Among its ingredients, the egg is the most critical in terms of mayonnaise stability. Egg is considered a high profile ingredient due to its high nutritional value and multifunctional properties, including emulsification, coagulation, foaming and flavoring of the product (Narsimhan and Wang 2008).

Cholesterol is present in egg yolk in amounts ranging from 180 to 250 mg, depending on the type of chicken (Stadelman and Cotterill, 1995).

The desire to replace the egg in food systems has been brought about by a lot of concerns from consumers and processors who wanted to have low cholesterol and safe food (Liu et al. 2007). Thus, several studies have been done on the removal or reduction of the egg in mayonnaise (Takeda et al., 2001).

Emulsifiers generally act through one or more mechanisms, including reducing the surface tension between the oil and water phases or covering fat globules with a loaded layer to create a physical barrier that prevents flocculation (Walstra, 1986). Stabilizers, mainly polysaccharides, usually stabilize emulsions by increasing the viscosity of the aqueous phase.

Whey proteins are known to alter their adsorption behavior at fluid interfaces that respond both to different aqueous environmental conditions (Davis et al., 2004) and to the presence of several food additives, such as lipids and polysaccharides (Rodriguez Patino et al.2008; Hîlma, 2016), sugars (Yang et al. 2009), electrolytes (Marinova et al., 2009), polypeptides (Martinez et al., 2009).

Macromolecular interactions between whey protein in milk and Xanthan, both in solution and in the vicinity of the interface, depend on the type of protein and the relative concentration of the biopolymer in the aqueous subphase (Perez et al., 2009).

MATERIAL AND METHOD

This paper compares the rheological and physical properties of conventional mayonnaise and mayonnaise with combinations of whole milk and the decrease or removal (partial or total) of the egg.

The objectives we pursued in this paper were: analysis of the growth/cremation index of mayonnaise; analysis of heat stability of mayonnaise; analysis of the physical stability of mayonnaise; analysis of the variation of the apparent viscosity of mayonnaise depending on the temperature and shear rate; quantification of the size of the parameters of the Casson mathematical model affected by the state variables: the concentration and ingredients of mayonnaise.

In this paper we replaced the eggs with mixtures of milk and xanthan.

The substitution of eggs with milk and xanthan mixtures was selected from 0-100% and 0-0.2%, respectively (Nikzade, 2012; Hîlma, 2019).

Seven tests were used to achieve the objectives of the paper:
- standard control mayonnaise (F1) without hydrocolloids, 10% egg;
- mayonnaise (F2) 8% egg, 1.9% milk, 0.1% xanthan;
- mayonnaise (F3) 2% egg, 7.9% milk, 0.1% xanthan;
- mayonnaise (F4) 0% egg, 9.9% milk, 0.1% xanthan;
- mayonnaise (F5) 8% egg, 1.8% milk, 0.2% xanthan;
- mayonnaise (F6) 2% egg, 7.8% milk, 0.2% xanthan;
- mayonnaise (F7) 0% egg, 9.8% milk, 0.2% xanthan.

The standard temperature of the ingredients was 8° C.

Each formulation was prepared once and each experiment was performed in 3 replicates. After preparation, the samples were kept in the refrigerator (4-5ºC) until analysis (Liu et al., 2007).

The differences between the seven formulas of mayonnaise consist in changing the concentration of the ingredients, namely egg yolk, milk and xanthan hydrocolloid, the amount of other ingredients remaining unchanged.

In the standard formula (F1) I used 10% egg yolk, without hydrocolloids.

I changed the second formula (F2), decreasing the yolk concentration to 8%, but I increased the milk concentration to 1.9% and xanthan 0.1%.

In the third formula (F3) I decreased the egg yolk concentration to 2%, I increased the milk concentration to 7.9% and xanthan 0.1%.

In the fourth formula (F4) I replaced the liquid egg yolk with 9.9% milk and 0.1% xanthan.

In the fifth formula (F5) I increased the concentration of egg 8% and xanthan 0.2%, decreasing the concentration of milk to 1.8%.

The sixth formula (F6) contains 2% egg, 7.8% milk and 0.2% xanthan.

In the last formula (F7) I replaced the liquid egg yolk with 9.8% milk and 0.2% xanthan.

Viscosity measurements were performed on mayonnaise samples at room temperature (200C) with the Brookfield viscometer (Brookfield Engineering Inc, Model DV E) and 5 different Rpm speeds (5, 10, 20, 50, 100) with the LV 3C axis no. 67.

In order to achieve the objectives listed above, taking into account the physical properties of the product under analysis, I made the following determinations:

- Determining the growth/creaming index of mayonnaise;
- Determining the heat stability of mayonnaise;
- Determining the physical stability of mayonnaise;
- Determining the apparent viscosity, shear rate and shear stress of mayonnaise;
- Determining the Casson yield to characterize how mayonnaise will behave during consumption, in terms of quality.

RESULTS AND DISCUSSION

The first determination consisted in measuring the viscosity of the mayonnaise samples depending on the concentration of the ingredients: egg, milk, xanthan and 5 different Rpm speeds (5, 10, 20, 50, 100).

The results obtained at a constant torsion (48.71%) frame mayonnaise as a non-Newtonian thixotropic liquid.

Thus, all samples of mayonnaise, regardless of the formula used, are non-Newtonian time-dependent, thixotropic liquids that suffer from decreased viscosity, with the change in the concentration of ingredients (egg, milk, xanthan) at a constant shear rate.

Mayonnaise exhibits non-Newtonian behavior and the same behavior was observed in this paper.

The apparent viscosity of the mayonnaise samples decreased in all formulas with increasing shear rate and shear strength, except for the formula in which the egg was replaced 100% with milk and xanthan gum.

The apparent viscosity is inversely proportional to the shear rate and shear stress.

The apparent viscosity of the mayonnaise samples decreased with increasing shear rate, indicating a non-Newtonian liquid, and showed shear thinning behavior characterized by flow behavior values (Casson yield value) less than 1.

The flow curves for mayonnaise samples made from different amounts of milk, xanthan and egg are shown in Figure 1.
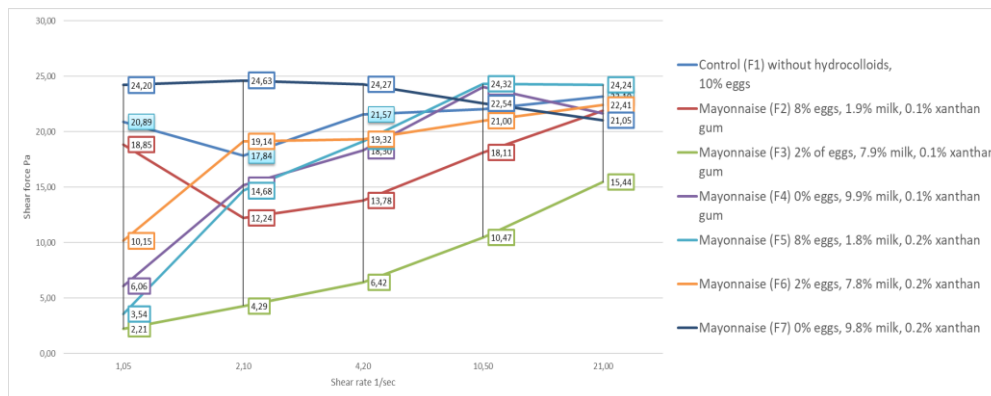
Fig. 1. Comparison of flow curves in mayonnaise samples

For all mayonnaise samples, the relationship between shear stress and shear rate was nonlinear, showing a behavior of thinning shear (pseudoplastic liquids).

As Rao wrote, the Casson model is considered a mathematical equation that describes rheological data, such as shear rate versus shear force, in a basic shear diagram, and provides a convenient and concise way to describe the data.

The Casson yield value is important in determining the consistency index.

The value of the Casson yield (Figure 2) or the consistency index of the mayonnaise samples decreased until the egg was replaced with milk and xanthan (mayonnaise (F4) 0% egg, 9.9% milk, 0.1% xanthan), but for the higher content, except for the 100% replacement, increased.

The lowest consistency index (31.91 Pa), was observed in the sample containing 100% milk together with 0.2% xanthan, and the highest (4.39 Pa) was recorded among the analyzed samples 9.9% replacement milk together with 0.1% xanthan.

Also, the highest shear thickening property was observed for the control and replacement of 100% milk together with 0.2% xanthan.

Also, for all samples, the flow behavior index showed a thin shear behavior.
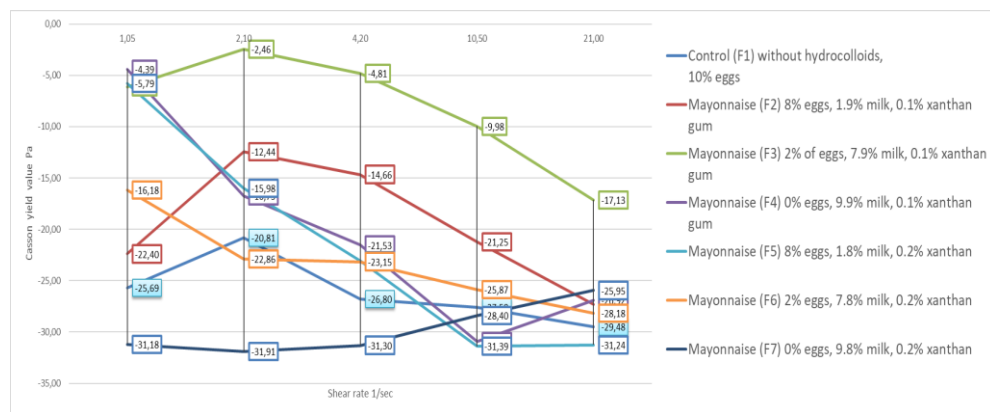

Fig.2. The value of Casson's yield in mayonnaise samples

The apparent viscosity of the mayonnaise samples decreased with increasing egg replacement from 20% to 80%, as the highest and lowest viscosity observed in the samples contained 100% (18.91 Pa s at shear rate 1.05 s^{-1}) and 80% replacement (5.18 Pa s at shear rate 1.05 s^{-1}) (Figure 3).

The increase in shear rate and the percentage of substitutes (milk and xanthan) led to a decrease in the apparent viscosity.

The apparent viscosity of the samples containing 20%, 80% and 100% egg substitutes compared to the control sample (100% egg) were lower.

The increase in the concentration of xanthan resulted in a decrease in the viscosity of the samples compared to the control.

Increasing the concentration of xanthan and milk decreased the viscosity of all samples, except where we replaced the egg 100%, being the highest viscosity recorded for sample F7 (18.91 Pa s) (99.8% milk and 0.2% xanthan gum).

All investigated mayonnaise samples containing milk proteins and xanthan gum showed a shear-thinning behavior (Raymundoa et al. 2002).

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From this point of view, it can be concluded that milk with xanthan gum not only maintained the structure of mayonnaise, but had a greater effect on the viscosity and flow parameters of the mayonnaise samples compared to the egg.
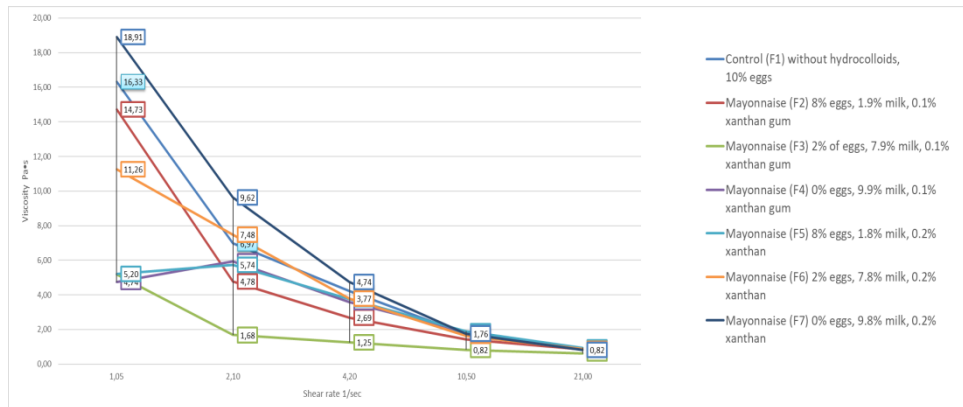

Fig.3. Apparent viscosity compared to the shear rate for the various samples of mayonnaise

During the 7-day storage period, samples of mayonnaise 3, 4 and 5 were greater than 50%, except for samples 1, 2, 6 and 7.

The highest stability was recorded for samples 4 and 5 (80 %) and the lowest for sample 7 (26.66%) compared to the control sample.

The samples of mayonnaise 4 and 5 for 7 days of storage showed more than 80% stability and there were no significant differences between them.

In this study, all mayonnaise samples, except samples 1, 2, 6 and 7, showed heat stability of more than 50% during the 7-day storage period.

The highest heat stability recorded for samples 4 and 5 (80%) and the lowest for sample 7 (26.66%) were significantly different compared to the control sample.

The rest of the samples during the 7-day storage had higher heat stability and did not have significant differences between them.

In this study, the addition of milk with xanthan (as an egg substitute) to mayonnaise protected the separation of the emulsion phases compared to the control sample during the 4-day storage period.

Sun et al. explained similar cremation behaviors with different concentrations of XG in mayonnaise. (2007).

Hennoc et al. (1984) reported that in emulsions containing 60% oil, the presence of xanthan to prevent phase separation is essential.

This is due to the strong increase in viscosity that prevented the liquid from moving by decreasing the burning rate (McClements, 2004).

But the phenomenon of creaming or growth was observed in the samples containing 1.9% milk, 0.1% xanthan (F2), 7.9% milk, 0.1% xanthan (F3) and 9.8% milk, 0.2% xanthan (F7) substitutes after 4 days storage due to large particle size and low viscosity.

CONCLUSIONS

This paper compares the rheological and physical properties of conventional mayonnaise and mayonnaise with whole-milk combinations and the decrease or removal (partial or total) of the egg. All samples show the same shear force, regardless of the formula used, under conditions of a constant shear rate. The results obtained at a constant torsion (48.71%) frame mayonnaise as a non-Newtonian thixotropic liquid. All samples of mayonnaise, regardless of the formula used, are non-Newtonian time-dependent liquids, thixotropic, which suffers a decrease in viscosity, with the change in the concentration of ingredients (egg, milk, xanthan) at a constant shear rate. The highest shear thickening property was observed for the control and replacement of 100% milk together with 0.2% xanthan.

For all samples, the flow behavior index showed a thin shear behavior. The increase in shear rate and the percentage of substitutes (milk and xanthan) led to a decrease in the apparent viscosity. The apparent viscosity of the samples containing 20%, 80% and 100% egg substitutes compared to the control sample (100% egg) were lower. The increase in the concentration of xanthan resulted in a decrease in the viscosity of the samples compared to the control. The increase in the concentration of xanthan and milk decreased the viscosity of all samples, except where we replaced the egg 100%, the highest viscosity being recorded for the F7 sample.The highest stability was recorded for samples 4 and 5 and the lowest for sample 7 compared to the control sample. All mayonnaise samples, with the exception of samples 1, 2, 6 and 7, showed heat stability of more than 50% during the 7-day storage period. The addition of milk together with xanthan (as an egg substitute) to the mayonnaise protected the separation of the emulsion phases compared to the control sample during the 4-day storage period. From this point of view, it can be concluded that milk with xanthan gum not only maintained the structure of mayonnaise, but had a greater effect on the viscosity and flow parameters of the mayonnaise samples compared to the egg.

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MEDICAL VISITS FOR OUTPATIENS DURING EMERGENCY STATE DUE TO CORONAVIRUS PANDEMIC

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Abstract
The COVID-19 pandemic has brought dramatic changes to the medical services of outpatient care. The measures imposed by the State of Emergency associated with the fear of infection, drastically reduced the number of consultations at the endocrinology outpatient clinic, respectively the patient-doctor communication.

Key words: patient, emergency state, COVID 19

INTRODUCTION

A State of Emergency is a governmental declaration that may alter the normal functioning of certain legislative, executive or judicial institutions. Such statements usually take place during pandemics, natural disasters, after a declaration of war or during periods of popular uprisings. Emergency statements warn citizens to change their normal behavior and order government agencies to implement contingency plans.

Romania has entered a State of Emergency on Monday, 16th of March 2020, due to the COVID-19 coronavirus pandemic, by Decree no. 195/ 16.03.2020. This was the first state of emergency established in Romania after December 1989. Starting with 15th of April 2020, the President extended by 30 days the state of emergency throughout Romania, due to the evolution of the COVID-19 pandemics.

The state of emergency is a set of exceptional measures of a political, economic and public order nature, applicable throughout the country or in some administrative-territorial units. The exceptional measures applied by the Government, included the following dispositions:
- courses in all educational units and institutions are suspended;
- the central and local public administration authorities will take measures to organize the activity so as to avoid direct contact between persons, including electronic means of communication;
- isolation and quarantine of persons from risk areas, as well as those who come into contact with them;
- gradual closure of state border crossing points;

- restricting or prohibiting the movement of vehicles or persons in/ towards certain areas or between certain hours, as well as leaving those areas;
- temporary closure of restaurants, hotels, cafes, clubs, casinos, association headquarters and other public places.

From medical point of view, it was established that:
- medical services and medicines can be granted and validated without signing with the national health insurance card and without a reporting period within 3 working days from the date of providing the services;
- the settlement of the medical services in the primary medical care units and for the specialized assistance in ambulatory, to the level of the activity that was actually performed, with maximum 8 consultations / hour;
- the prescription of medicines by family doctors, including restricted medicines from the List of medicines, approved by Government Decision no. 720/2008, for chronic patients.
- for medical services, medicines, laboratory investigations granted during the state of emergency, the amounts committed will not be limited to those approved for the first quarter of 2020.
- limiting the activity of public hospitals to hospitalization and solving urgent cases

MATERIAL AND METHODS

To conduct this observational study, we followed the flow of patients during the 2 months pandemics (16.03.2020-13.05.2020), at the Bihor County Emergency Hospital – Outpatient Endocrinology Clinic.

The objective was to compare the attitude of patients (regarding their needs, the COVID-19 infection risks, their addressability to health care services etc.) during the state of emergency (caused by the COVID-19 pandemic) and non-pandemic period.

RESULTS AND DISCUSSIONS

The first confirmed case of Coronavirus infection was registered on February 26th 2020, and in the next two weeks the sporadic nature of the disease was maintained, being confirmed 1-2 cases daily. From March 10th, the daily number of confirmed cases follows an upward trend, with an average of 55 cases/day in week of March 16-22, 200 cases/ day in the week of March 23-29, reaching an average of 300 cases/ day at the beginning of April.

Acute endocrine pathology is not very often; this is the reason why many patients with endocrine dysfunctions contact the specialized outpatient service. In average, there were 35 patients consulted per day. When the emergency state was declared, the number of patients presenting for consult decreased drastically: 5-12 patients/ day. There were more reasons for this situations (Fig.1):
- fear of contacting the virus in a hospital setting, where the incidence of sick people is high;
- the belief that the outpatient clinic is closed
- information that doctors consult only medical emergencies (the idea that only serious situations or patients infected with Sars-CoV-2 have access to specialized services)
- restricting the movement of persons over 65 years of age (including the situation in which the period of free movement did not overlap with the doctor's consultation program)
- information from the media
- fear of transmitting Coronavirus infection to sick or at-risk family members
- promoting telemedicine

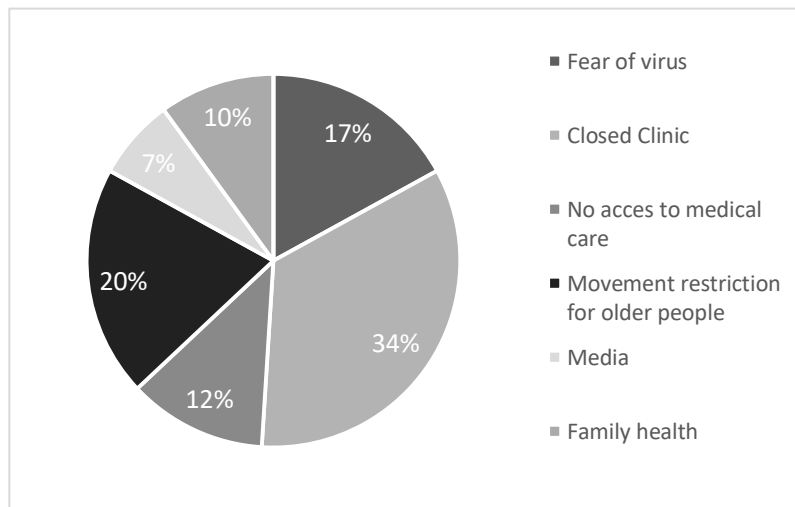Fig. 1. Reasons for avoiding endocrinology consult during Emergency State

This situation is not limited to our clinic. A study conducted by Harvard University and Phreesia (a health care technology company) shows that the number of visits to ambulatory practices (in U.S.) fell nearly 60 percent by early April before rebounding through mid-June. From then through the end of July, weekly visits plateaued at 10 percent below the

prepandemic baseline. The cumulative number of lost visits since mid-March remains substantial and continues to grow (Mehrotra a. et al, 2020).

All patients that came in to the clinic (during Emergency state) were younger than 65 years – it is important to mention, taking into account the fact that at least a quarter of total number of patients registered in the outpatient Endocrinology clinic are over 65 years.

Despite de pandemics and the Emergency State, they required a consult because:

- they were scared about their laboratory results
- they just wanted to see if there is anybody to offer them medical services and guidance
- they were not pleased with telemedicine service
- they needed medical advice when starting to feel worse and the emergency medical services indicated an endocrinology consult

There was a lack of communication between non COVID patient and medical healthcare provider during emergency state.

After ending the restrictions induced by the state of Emergency, people started to come back to the doctor more often, reaching the number of usual prepandemic visits at the end of the summer/ beginning of autumn. Most patients maintained a stable physical state (65%), the rest bring in laboratory analysis indicating decompensation. More than 80% of patients came back with depression and neuro-vegetative symptoms that begin during emergency state, without any correlation to their hormonal problem.

CONCLUSIONS

The coronavirus pandemic induced a State of Emergency in Romania, between March and May 2020.

The restrictions determined by the State of Emergency, the fear of illness, the erroneous information, determined the decrease of the medical consultations in the specialized outpatient clinic. Patients presented to the doctor only in exceptional cases.

Reducing access to medical services, have imprinted on many patients a state of depression not correlated to hormonal dysfunctions.

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IDENTIFICATION OF C.DIFFICILE IN FOOD TOXINFECTION

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Abstract
The microorganisms represent the object of study of the microbiology. They compose a wide and heterogeneous group as a biological activity, having as common characters the microscopic dimensions that make them invisible to the naked eye.
In this group are included the bacteria, microscopic fungi (yeasts, molds), viruses. The microbiology reunites the biological sciences that have as object the study of microorganisms. Kircher intuits the existence of the microorganisms.
The theory of the spontaneous generation was pretty fast explained. If the food is staying more time in unfavorable conditions of environment, they enter in putrefaction. If they are examined under the microscope it is observed the presence of a very large number of bacteria. Where do these bacteria come from if they are not found in fresh food. Some researchers say that from the air, others spontaneous from inert matter.

Keywords: microorganism, molds, yeast

INTRODUCTION

The numerous microorganisms are saprophytes and some of them, including here the bacteria, viruses, yeasts, molds and protozoans occupy an important place in the food industry.

The bacteria, organisms present in almost all the natural ecosystems, is well defined biologically by the prokaryotic type of organization.

The viruses are microorganism extremely small, which in order to multiply utilize the resources of the host cell of vegetal type, animal or bacterial.

The yeast and molds are fungi that contain chlorophyll. They have variable dimensions, from unicellular organisms to large fungi.

The protozoans are unicellular organisms considered in the category of the animal kingdom due to the different forms in which they live. These can produce diseases in human beings and animals.

By the determining of the sequence there is information achieved, being supplied new data necessary for the establishing of the evolutional

relations. As any other technique of the molecular biology, the determination of the DNA or RNA sequence needs time and large costs.

Some members of the Eubacteria gender are identified frequently by the appealing to method of special colors and various biochemical tests.

The analysis of ribosomal RNA is made by analyzing the ribonucleic acid from the ribosomes and is possible the obtaining of information that can be used in taxonomy, the collected data being able to be used for the identification of the similarities of the RNA sequences.

From the structural point of view these organelle are made of ribosomal RNA and ribosomal proteins.

The analysis of DNA consists of the fact that the hybridizations of DNA-DNA or DNA-RNA were used a period of time and continue to be extremely valuable in the bacterial systematization. It was found that the ideal reference system for the bacterial taxonomy is the complete sequencing of the DNA of an organism.

MATERIAL AND METHODS

We performed a prospective study, based on the microbiologic diagnosis registered in the bacteriologic register of the laboratory of medical analysis, S.C. Diaser, Oradea.

The period for which was extended the study is of 5 years, including the period 01.01.2014-31.12.2019.

For the performing of the study was used also the archive, registered in the specific program of the computer from the laboratory of S.C. Diaser, Oradea, the computerized data basis of the unit.

The necessary materials for the performing of the examination:

■ A recipient of collection (collection recipient of fecal matter with collecting spoon) with transport medium

■ Wood spatula

■ Latex gloves

For the collection of fecal matter it has to be collected a sample of fecal matter of 5-10g introduced in the collection recipient of fecal matter with transport medium.

If the stool is liquid, it will be harvested 5 ml. It is recommended to be chosen a liquid, mucous and bloody portion, if there is one. Don't collect larger quantities than 10 g because will reduce the chances to isolate the pathogen bacteria.

RESULTS AND DISCUSSIONS

From the suspension of fecal matters are made directly dispersions on to selective mediums.

Agar phenethyl alcohol, preferably spiked with 5% of defribinated ram blood, that allows the growth of clostridias and other anaerobe gram positive present in the intestine content.

Agar with egg yolk, fructose and antibiotics (cefoxitin and D – cycloserine). This medium with high selective capacitive inhibits the other clostridias and anaerobe gram-positive cocci: they don't inhibit the *C.difficille*. Both mediums are incubated anaerobe 48 hours at 37°C.

The isolation with enriching, consists of the procedure of enriching, that was recommended and is used currently for a wide range of enteric pathogen that are found dispersed in a small number on the unit volume of fecal matters. The pathogen process being developed, the excreted bacteria are dispersed in a fecaloid mass becoming abundant by inhaling the intestine hydro-electrolytic. As a consequence the reduced density of the pathogens determined the introducing of a process of enriching of the etiologic agent in salmonellosis, yersiniosis, cholera.

In the low diarrhea syndromes, rectal-sigmodian and in the postantibiotics therapy intestinal disbacteriosis, the etiologic agent eliminated at a large density doesn't need enriching that could modify the reports between the groups of bacteria included in the fecal matters.

The phases of the bacteriologic examination by cultivation are presented below, after the initial phase, respectively the sampling, the methodological lines regarding the isolation and identification corresponding to each methodology of investigation are: aerobe, microaerophile and anaerobe.

From the registered data, in regard to the isolation of aerobe bacteria I am entitled to affirm that the aerobe bacterial etiology represents more than half of the known etiology of the diarrhea syndrome. In part, this "dominant" is caused also by the possibilities of investigation, accessible to the most laboratories from the hospitals and antiepidemic centers, that allow the specifying of the etiology more frequently than in the case of other groups of bacterial or viral etiologic agents. Being known the unsuccessful isolations due to the reduced number of etiologic agents on the unit of volume of the investigated sample, in some enterobacteriosis is recommended the "enriching of the inoculum by sub cultivation on mediums that favor by preference of the multiplication of the enteritis pathogens."

Fig.1. *C.difficille. medium of culture agar - blood. www.marlerblog.com*

The study regarding the "Detecting of *Clostridium difficile* and of the toxins in test samples of minced meat and cube of chopped red meat in modified athmosphere" underlines the prevalence of *Clostridium difficile* in the packed samples (MAP) chopped (n: 50) and the samples of red meat (n:50); It was determined the toxin from isolated and was detected the sensitivity to antibiotics, to metronidazole, vancomycin and clindamycin. *C. difficile* was isolated 4%, of the 50 samples of chopped red meat and 2%, of the 50 samples of cube chopped red meat. All the three isolated were confirmed by PCR as being *C. difficile* by detecting the gene. Three of the isolated, from the 5 of *C. difficile* presented a toxigenic nature, two of them bore genes of toxin type B (tcdB), one of them toxin gene type A (tcdA). When the profile of resistance to antibiotics was analyzed phetotipically, only *C. difficile* type A (tcdA) was resistant to clindamycin. All the isolated were sensitive to vancomycin and metronidazole. The result of this study demonstrated that the strains of *C. difficile* detected in the test samples of red meat packed in modified atmosphere (MAP) can be a possible problem for the public health.

CONCLUSIONS

Giving the diagnosis of laboratory in regard to the *Clostridium difficile,* is based on the culture and detection of toxins on the fecal samples. The culture is accomplished on selective medium available commercially.

The morphology of the *Clostridium difficile* colony is typical when it is examined under the optical microscope. The definitive identification is obtained the best by the chromatography of the liquid with gas.

The culture is very sensitive, but, when it is used alone without testing the toxin, lead to the low specificity and wrong diagnostic when there are not symptoms.

The detection of the toxin by an analysis of cytotoxin in the culture of the tissue followed by the neutralization with specific antiserum is often considered standard.

Beside all these, this approach has no sensitivity and did not detect but up to 30% of the patients. More immuno-enzymatic tests (EIA) were introduced by different manufacturers for the detecting of the toxin A alone or for both toxin A and B.

Some of them are conceive to give results in less than 1 hour. The comparative studies of the immune-enzymatic kits have reported that the sensitivity and specificity are a bit smaller than the cytotoxin tests.

The isolations in regard to *C. difficile* for the production of toxins, the colonies isolated on selective mediums are tested for the production of toxins in vitro either by a test of cytotoxicity or by direct immune-enzymatic tests. It has a higher sensitivity than the test of cytotoxicity and equivalent specificity. In the normal laboratory, the detection of the culture and of the toxins have to be performed on each test sample and, in the cases of toxic-positive and fecal culture, the toxigenic cultures have to be performed on isolated colonies.

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IDENTIFICATION OF SALMONELLA, SHIGELLA IN FOOD TOXINFECTIONS

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Abstract
The alteration of meat in low temperatures is accompanied by the production of some compounds of abnormal color, as ammonia, sulphureted hydrogen. The direct physical and bacteriological methods show that the samples of meat tainted are changing the organoleptic characteristics (smell, consistency, smell and taste). In order to foreseen the alteration or the period of validity, is asked for the performing of a test of freshness of meat. It was investigated their alteration, as indicators of alteration of red meat, packed in vacuum, kept at 1℃ , for a period of 8 weeks. In case the meat kept in aerobe conditions, it is quite the opposite. The fresh meat kept in the refrigerator is attacked by psychorophilic organisms. In case of the meat with a pH approximately of 5,6 there are present sufficient simple hydrates of carbon in order to sustain approximately 10^8 microorganisms/ cm^2.

Keywords: sulphureted hydrogen, ammonia, alteration

INTRODUCTION

All the serotypes of enteric *Salmonella* enteric subspecies are parasites for human being and mammals, while the other subspecies and bongori *Salmonella* are met mainly in birds and animals with cold blood. The two major sources, the human being and the animals, are responsible for the pollution of the soil and of the waters, where they can survive for a long time.

A series of factors as: intensification of the commerce and of the travels at great distances, the population migrations, the industrialization of the food and of the growth of the animals for consumption, have contributed to the wide spreading of serovars and to the growth of morbidity by salmonellosis.

The majority of the other serotypes instead don't have a specificity of host. There are serotypes of *Salmonella* with specificity of host, present only in human being (*S. typhi*, *S. paratyphi*), in animals (*S. typhisuis* – in pigs, *S.*

abortus ovis – in sheep) or in birds (*S. gallinarum, S. pullorum*). The isolation of the salmonellas from human host has always a clinical significance – sick person or healthy carrier. In general there is a geographical distribution of the salmonella, in our area being isolated most frequently Salmonella typhimurium, Salmonella enteritidis and in some periods*Salmonella agona*.

Toxina *Shiga*is a thermo labile exotoxin, with neur-, entero- and cytotoxic properties, with role in blocking the protein synthesis. By cytotoxic effect on the capillary endothelium it determines vascular complications and the producing of the hemolytic-uremic syndrome in shigellosis. It is produced by *S. dysenteriae* type 1 (*S. shigae*) and only in feeble quantities by the other species. For this cause *S. shigae* is the most pathogen from all the types.

The period of incubation is short (1-3 days), and the debut sudden, with fever, severe abdominal cramps, tenesmus, stools with initial watery nature, then mucopurulent and pathognomonic sanguinolent, accompanied by neurologic signs. Severe clinical forms are registered especially at extreme ages and in immune-depressed. *S. dysenteriae* serotype 1 (*S. shigae*) is responsible for the most severe forms of disease, complicated with hemolytic-uremic syndrome.

MATERIAL AND METHODS

We accomplished a prospective study, based on the microbiologic diagnosis registered in the bacteriological register of the laboratory of medical analysis, S.C. Diaser, Oradea.

The duration for which was extended the study is of 5 years, included in the period 01.01.2014-31.12.2019.

For the performing of the study was used also the archive, registered in the specific program of the computer from the laboratory of S.C. Diaser, Oradea, the computerized data base of the unit, respectively.

Necessary materials for the performing of the examination:

■ A recipient of collection (collection recipient of fecal matter with collecting spoon) with transport medium

■ Wood spatula

■ Latex gloves

For the collection of fecal matter it has to be collected a sample of fecal matter of 5-10g introduced in the collection recipient of fecal matter with transport medium. If the stool is liquid, it will be collected 5 ml. It is recommended to be chosen a liquid, mucous and bloody portion, if there is one.

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RESULTS AND DISCUSSIONS

In regard to the culture medium, the broth, for *Salmonella* with acid selenite of sodium in many versions, has the specificity of the fact that the selenite with cysteine gave the best results to the isolation of the serotypes met equally in human being. Its productiveness can be enriched also in the period of incubation shortened 12-18 hours by incubation 40-41°C. When the possibilities don't allow but a single medium of enriching, the medium with selenite is preferable. It is inhibitor for other enterobacteria (especially lactose-positive), but *Proteusul* and *Shigella* are developed relatively frequently. The Rappaport-Vasiliadis broth, underlined also as having a good capacity of enriching, is recommended and mentioned with higher results for the enriching of all the other serotypes, with the exception of *Salmonella serotip Typhi*.

The broth for the gram-positive results has the capacity more reduced than the selenite broth or the tetrathionate broth, allowing also the growth of other gram-positive bacilli, not only of the enterobacteriacae, for this reason it is recommended also for the isolation of some non fermented gram-negative bacilli pathogen conditioned.

The culture medium with the tetrathionate broth was used for the isolation of *Salmonella* serotype *Typhi*. It is used in more limited quantity because of the laborious preparation and the difficulties of commercialization as industrial product "ready to be used" or in dry form.

The microscopic examination of faecal samples indicates usually the presence of erythrocytes and leucocytes in a large number. The test has a significance if there is a number of polymorph nuclear (PMN) larger than 10/hpf (microscopic field with large power – objective 40x). The most frequently involved are the germs from the group *Shigella, Salmonella, Campylobacter, Escherichia coli* enteroinvasive and enterohemorrhagic. The greater the number of leucocytes present in faecal matters, the larger the probability of the existence of an invasive pathogen agent.

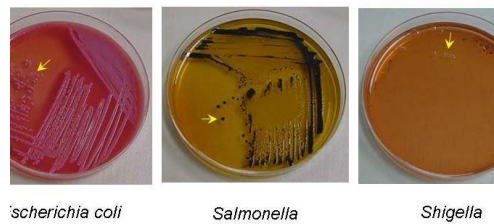Figura 1. *Salmonella – Shigella*, colonii lactozo – pozitiv, mediul de cultură SS.
https://microbenotes.com

Figure 2. *Escherichia Coli, Salmonella, Shigella*, lactose – negative colonies for E. Coli and Shigella. Lactose – negative colonies, Salmonella. Culture medium SS – Agar.
https://www.microbeonline.com

Figura 3. *Salmonella*: colonii "ochi de pisică".
Mediul de cultură SS
https://catalog.hardydiagnostics.com

The efficiency of the culture medium for *Salmonella – Shigella*is underlined in the study regarding the "Superiority of agar MacConkey compared to Agar *Salmonella-Shigella*for the isolation of *dysenteriae* Type 1".

Agar MacConkey was superior to the SS agar in detecting *S. disenteriae type 1*; 83% of the isolated were detectable on agar MacConkey, compared to 40% on agar SS. In exchange, 84% of the isolated *S. flexneri were detectable* on agar SS, compared to 51% only on agar MacConkey. These discoveries confirm the fact that, for the culture of the faecal test tubes about which is considered that *S. S. disenteriae tip I*, one of the used mediums, should be non-inhibitor.

CONCLUSIONS

The mediums moderately selective have a higher selective capacity, inhibiting considerably the lactose-positive enterobacteriaceae. Thus, they allow the unhindered development of lactose-negative enterobacteriaceae as *Salmonella, Shigella, Providencia, Proteus, Morganella* and tardive lactose-positive, *Citrobacter, Serratia,Hafinia*. Enterocolitis *Yersinia*is hardly developed, usually after the continuation of the incubation 22-29℃ maximum 24 hours, and on some mediums, as ADCL, XLD, IM, SMID, is strongly inhibited. This mediums are usually used for the isolation of pathogens from the *Salmonella and Shigella* genre.

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DIFFERENTIAL SUBORDINATION RESULTS FOR CERTAIN GENERALIZED DIFFERENTIAL OPERATOR

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Abstract
        The purpose of the paper is to deduce certain differential subordination results by making use of a generalized differential operator.

Key words:analytic functions, generalized differential operator, differential subordination.

AMS Subject Classification: 30C45.

INTRODUCTION

1.
In the first section we will recall some definitions and results used for the new obtained results.
Denote by U the open unit disc of the complex plane:
$U = \{z \in \mathbb{C} : |z| < 1\}$.
Let $\mathcal{H}$ be the class of analytic functions in U and for $a \in \mathbb{C}$ and $n \in N$ let $\mathcal{H}[a,n]$ be the subclass of $\mathcal{H}$ consisting of functions of the form
$f(z) = a + a_n z^n + a_{n+1} z^{n+1} + ...$, $z \in U$.
Let $\mathcal{A}(p,n)$ denote the class of functions $f(z)$ normalized by
$(1.1) f(z) = z^p + \sum_{k=p+n}^{\infty} a_k z^k$, $(p, n \in \mathbb{N} := \{1,2,3,...\})$
which are analytic in the open unit disc.
In particular, we set

$$\mathcal{A}(p,1) := \mathcal{A}_p \text{ and } \mathcal{A}(1,1) := \mathcal{A} = \mathcal{A}_1.$$

Let

$$\mathcal{A}_n = \{f \in \mathcal{H}(U), f(z) = z + a_{n+1} z^{n+1} + ...\}$$

with $\mathcal{A}_1 := \mathcal{A}$.

We denote by Q the set of functions f that are analytic and injective on $\overline{U} \setminus E(f)$, where

$$E(f) = \{\zeta \in \partial U : \lim_{z \to \zeta} f(z) = \infty\}$$

and are such that $f'(\zeta) \neq 0$ for $\zeta \in \partial U \setminus E(f)$.

Since we use the terms of subordination and superordination, we review here those definitions.

If f and g are analytic functions in U, then we say that function f is subordinate to g or g is said to be superordinate to f, if there exists a function w analytic in U, with $w(0)=0$ and $|w(z)|<1$, and such that $f(z) = g(w(z))$. In such case we write $f \prec g$ or $f(z) \prec g(z)$.

If g is univalent, then $f \prec g$ if and only if $f(0)=g(0)$ and $f(U) \subset g(U)$.

Further, we will recall here a differential operator introduced earlier.

Let the function f be in the class $\mathcal{A}_n$. For $m, \beta \in N_0 = \{0, 1, 2, \ldots\}$, $\lambda \geq 0$, $l \geq 0$,

we will use the following differential operator

$$(1.2)\, I^m(\lambda, \beta, l)f(z) := z + \sum_{k=n+1}^{\infty} \left[\frac{1 + \lambda(k-1)+l}{1+l}\right]^m C(\beta, k) a_k z^k$$

where

$$C(\beta, k) := \binom{k+\beta-1}{\beta} = \frac{(\beta+1)_{k-1}}{(k-1)!}$$

and

$$(a)_n := \begin{cases} 1, & n = 0 \\ a(a + 1)\ldots(a + n - 1), & n \in N - \{0\} \end{cases}$$

is Pochhamer symbol.

Using simple computation one obtains the next result.

MATERIAL AND METHOD

2.PRELIMINARY RESULTS

Proposition 1.1 Form, $\beta \in N_0$, $\lambda \geq 0$, $l \geq 0$

(2.1)

$$(l + 1)I^{m+1}(\lambda, \beta, l)f(z) = (1 - \lambda + l)I^m(\lambda, \beta, l)f(z) + \lambda z(I^m(\lambda, \beta, l)f(z)'$$

and

(2.2)

$$z(I^m(\lambda, \beta, l)f(z))' = (1 + \beta)I^m(\lambda, \beta + 1, l)f(z) - \beta I^m(\lambda, \beta, l)f(z).$$

Remark 2.1 Special cases of this operator includes the Ruscheweyh derivative operator $I^0(1, \beta, 0)f(z) \equiv D_\beta$ defined in [7], the Sălăgean derivative operator $I^m(1, 0, 0)f(z) \equiv D^m$, studied in [8], the generalized Sălăgean operator $I^m(\lambda, 0, 0) \equiv D_\lambda^m$ introduced by Al-Oboudi in

[1], thegeneralized Ruscheweyhderivative operator $I^1(\lambda, \beta, 0)f(z) \equiv D_{\lambda,\beta}$introduced

in [6], the operator $I^m(\lambda, \beta, 0) \equiv D_{\lambda,\beta}^m$introduced by K. Al-Shaqsiand M. Darus in [2], and finally the operator $I^m(\lambda, 0, l) \equiv I_1(m, \lambda, l)$introduced in [3].

To prove the main results we will need the following lemma.
Lemma 2.1(Miller and Mocanu [4]) Let q be a convex function in Uand let
$$h(z) = q(z) + n\alpha zq^t(z)$$
where $\alpha > 0$ and n is a positive integer.
If
$$p(z) = q(0) + p_n z^n + \cdots \in \mathcal{H}[q(0), n]$$
and
$$p(z) + \alpha zp^t(z) \prec h(z)$$
then
$$p(z) \prec q(z)$$
and this result is sharp.

3. MAIN RESULTS

Theorem 3.1Let q(z) be a convex function, q(0) = 1, and let h be afunction such that
(3.1) $\qquad h(z) = q(z) + n\lambda zq''(z), \lambda > 0.$
If $f \in \mathcal{A}_n$ and verifies the differential subordination
(3.2) $\qquad (I^{m+1}(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))' \prec h(z)$
where
$$\widetilde{\Psi}(\alpha, f; z) = z\Psi(\alpha, f; z)$$

$$\Psi(\alpha, f; z) = (1 - \alpha)\frac{zf'(z)}{f(z)} + \alpha(\frac{zf''(z)}{f'(z)} + 1),$$
then
(3.3) $\qquad (I^m(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))' \prec q(z)$

and the result is sharp.
Proof.By using the properties of the operator $I^m(\lambda, \beta, l)$,
we have
(2.4) $\quad (l+1)I^{m+1}(\lambda, \beta, l)f(z) = (1 - \lambda + l)I^m(\lambda, \beta, l)f(z) + \lambda z(I^m(\lambda, \beta, l)f(z))'.$

If we denote by
(3.5) $\qquad p(z) = (I^m(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))'$
where $\qquad p(z) = 1 + p_n z^n + \ldots, p(z) \in \mathcal{H}[1, n],$
then,

after a short computation we get

(3.6) $(I^{m+1}(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))' = p(z) + \lambda zp'(z), z \in U.$

From (3.4), (3.5) and (3.2) we obtain

(3.7) $p(z) + \lambda zp'(z) \prec q(z) + n\lambda zq'(z) \equiv h(z)$

then,

by using Lemma 2.1 we get

$$p(z) \prec q(z)$$

or

$$(I^m(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))' \prec q(z), \quad z \in U,$$

and this result is sharp. □

Theorem 3.2 Let q be a convex function with q(0) = 1 and let h be a function of the form

(3.8) $h(z) = q(z) + nzq'(z), z \in U.$

If f $\in \mathcal{A}_n$ verifies the differential subordination

(3.9) $(I^m(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))' \prec h(z), \quad z \in U,$

then

(3.10) $(I^m(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))/z \prec q(z)$

and this result is sharp.

Proof. If we let

$$p(z) = (I^m(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))/z, z \in U,$$

then we obtain

$$(I(\lambda, \beta, l)\widetilde{\Psi}(\alpha, f; z))' = p(z) + zp'(z), \quad z \in U.$$

The subordination (3.9) becomes

$$p(z) + zp'(z) \prec q(z) + nzq'(z)$$

and from Lemma 2.1 we have (3.10). The result is sharp. □

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CURRENT TRENDS IN CEREALS PRODUCTION AND MARKETING FOR THE NORTH-WEST REGION OF ROMANIA

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Abstract
The paper presents the main trends manifested in the production and marketing of cereals in the North-West Region of Romania, in the period 2014-2019. The paper analyzed the main indicators that point to the evolution of the cereal sector in this region. The indicators presented in the paper varied from one year to another. The largest area cultivated with grain cereals in the North-West Region of Romania was 522,405 hectares, registered in 2016, representing 9.52% of the area cultivated with cereals at national level. The largest areas in the analyzed region were cultivated with corn in 2016, namely 279,496 hectares. Also, it was found that the highest production was also obtained for corn, in 2018, of 1,953,648 tons. This was due on the one hand to the large cultivated areas and, on the other hand, to the high yields per hectare achieved for the maize crop. The statistical data that formed the basis of this paper were provided by the National Institute of Statistics.

Key words: average production per hectare of cereal grains; cereals; commercialization; North-West Region; price

INTRODUCTION

The North-West Region of Romania is included in Macroregion 1 and was created based on Law 151/1998. This region has in its composition the following counties: Bihor; Bistrita-Nasaud; Cluj; Maramures Satu Mare and Sălaj. The North-West region has an area of 34,160 km^2, which represents 14.3% of the total territory of Romania, occupying the 4th place nationally (*https://www.nord-vest.ro/wp-content/uploads/2020/02/0.-Profil-socio-economic-Regiunea-Nord-Vest-draft-1.pdf*).

In the North-West Region, according to official statistics, agriculture has played a significant role for the regional economy. Thus, in 2016, the share of the agricultural sector in gross value added was 4.58%. This share registered in the North-West region was higher than the European average

registered in 2017, which was only 1.6% (*https://www.nord-vest.ro/wp-content/uploads/2020/06/SWOT-Draft-PDR-2021-2027.pdf*)**.**

In 2014, the value of agricultural production in the North-West region was 10,950,382 thousand lei, representing 12.6% of the value of vegetable production in Romania, in 2019, it was 7,304,362 thousand lei, representing 11.6% of the value of the vegetable product made in Romania. In this region, cereal crops occupy over 50% of the total cultivated areas. Cereals present a particular importance for both human and animal nutrition *(Pânzaru R.L., Medelete D.M., 2017), (Popescu A., 2018)*. It is important to remember that cereals have a multitude of very important characteristics both in terms of food and economy *(Soare E., Chiurciu I.A., 2016), (Soare E., Dobre I., 2016*). Of these, the most representative are:

➢ low humidity content, which contributes to ensuring preservability for long periods of time;
➢ the nutritional value of cereals does not change over time;
➢ cereals represent a valuable raw material for a series of food products that can be consumed daily by people, without affecting the proper functioning of the human body;
➢ cereals are an important raw material for several industries;
➢ cereals are well suited for irrigation;
➢ cereals can be grown in an ecological system without great difficulties;
➢ ratio between proteins and carbohydrates of 1: 6, very beneficial to the human body;
➢ the cultivation technology for grain cereals is completely mechanized, etc *(Ion V., 2010)*.

MATERIAL AND METHOD

The paper analyzed the specific indicators of the cereal sector in the North-West Region of Romania, for the period 2014-2019. Here, the following indicators were analyzed: the area cultivated with grain cereals at both regional and county level; the area cultivated with the main cereals within the North-West Region; grain production at regional and county level; production for the main categories of cereals at regional level; average production per hectare for grain cereals at national and county level; yield per hectare for the main categories of cereals and average purchase prices for the main categories of cereals registered in the North-West Region. In the present paper, quantitative secondary statistical data were analyzed, taken from the National Institute of Statistics from the Tempo online database. The research results are presented in tabular form, in order to highlight as clearly as possible, the evolution of the analyzed indicators. In order to carry out this paper, a series of specialized materials were also

consulted, which are specified both in the paper and in the "Bibliography" section.

RESULTS AND DISCUSSION

Area cultivated with grain cereals. The area cultivated with grain cereals in the North-West Region of Romania fluctuated from one year to another, during the analyzed period (see Table no.1). This situation has also been registered at national level. It is necessary to remember that, in the North-West Region, grain cereals are cultivated mainly (over 50% of the total cultivated area). From the statistical data presented and analyzed it was observed that the smallest area with grain cereals was cultivated in 2014 (476,597 ha). In 2014, the area cultivated with grain cereals in the North-West Region represented 8.75% of the total area cultivated with grain cereals in Romania. At the opposite pole, the largest area cultivated with grain cereals was registered in 2016 (522,405 ha). The area cultivated with grain cereals from the North-West Region represented 9.5% of the total area cultivated with grain cereals at national level. In 2019, in the North-West Region, the area cultivated with grain cereals increased by 5.9%, compared to 2014. This increase was due to several factors, among which we mention: the increase of farmers' interest in this culture; state subsidies for cereals; increase in demand for grain on the regional market due to the intensification of the livestock sector, which contributes significantly to the regional economy, etc.

Table 1

Dynamics of the surface cultivated with cereals for grains in the North-West region, in the period 2014-2019 (hectares)

Specification	2014	2015	2016	2017	2018	2019	2019/ 2014 (%)
NORTH-WEST Region	476,597	516,364	522,405	492,397	504,764	504,988	105.9
Bihor	174,927	214,375	211,868	201,581	202,265	204,101	116.6
Bistrita-Nasaud	32,162	33,912	34,078	30,339	30,090	30,102	93.5
Cluj	70,732	68,022	72,786	66,869	71,787	72,875	103.0
Maramures	26,957	27,663	28,783	26,062	28,857	27,977	103.7
Satu Mare	135,600	134,138	135,535	129,807	134,003	131,883	97.2
Salaj	36,219	38,254	39,355	37,739	37,763	38,049	105.0

Source: Own processing based on NIS, Tempo- Online Database, 2020

Within the counties in the North-West Region, it was observed that the area cultivated with grain cereals changed during the period analyzed differently. The most significant areas are found in Bihor and Satu Mare counties. From the presented statistical data, it is found that, in Bihor county, in 2015, the largest area with cultivated grains was registered, of

214,375 ha. Also here, in 2019, there was the highest percentage increase (+ 16.6%) of the area cultivated with grain cereals, compared to 2014. Satu Mare County ranks 2nd in the top counties in the North-West Region, depending on the area cultivated with grain cereals. The largest area cultivated with cereals was registered in 2014 (135,600 ha). In 2019, in this county, there is a slight decrease (-2.8%) of the area cultivated with cereals, compared to 2014. Cluj County ranks 3rd in the top grain cereal cultivator counties in the North-West Region. Here, in 2019, the surface cultivated with grain cereals increased by 3.0%, compared to 2014. In Salaj County, the largest cultivated area was 39,355 ha (2016). In Bistrita-Nasaud County, in 2019, the area cultivated with cereals decreased by 6.5%, compared to 2014. In Maramures county, from the presented data, the smallest areas with grain cereals were cultivated. However, in 2019, in this county the area cultivated with grain cereals increased by 3.7%, compared to 2014.

In table no. 2 it is shown the evolution of the cultivated area with the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. From the presented statistical data, it is observed that the corn culture is very well represented in the areas cultivated with cereals. This crop occupies the first position in the ranking of cereal crops, with the largest cultivated area in 2016 (279,496 ha). The smallest cultivated area with cereals was 254,391 ha (2017). In 2019, there was a slight decrease in the cultivated area by 0.3%, compared to 2014. The second place in the ranking of areas cultivated with cereals is occupied by wheat culture. In the North-West region in 2019, the area cultivated with cereals represented only 55.5% of the area cultivated with corn. The area cultivated with wheat registered variations from one year to another. The most significant area related to wheat cultivation was in 2019 (146,911 ha), and the smallest area was 122,922 ha (2014). In 2019, the area cultivated with wheat registered an increase of 19.5%, compared to 2014. This percentage increase for wheat cultivation is the largest increase among the main cereal crops in the North-West Region.

Table 2

Dynamics of the surface cultivated with the main cereals in the North-West region, in the period 2014-2019 (hectares)

Specification	2014	2015	2016	2017	2018	2019	2019/ 2014 (%)
Wheat-total	122,922	146,614	144,662	142,875	144,426	146,911	119.5
Corn grains	265,360	276,771	279,496	254,391	263,858	264,569	99.7
Oat	35,159	35,516	35,793	33,951	34,667	34,101	96.9
Barley	11,620	14,260	15,514	14,330	15,038	13,991	120.4
Sorghum	1,294	805	792	11,99	1,338	1,109	85.7
Rye	802	1,142	1,003	629	692	690	86.0

Source: Own processing based on NIS, Tempo-Online Database, 2020

The most significant area cultivated with oat was 35,793 ha (2016), and the smallest was registered in 2017 (33,951 ha). In 2019, there is a decrease of 5.1% of the area cultivated with oat, compared to 2014. In order to form an image about the appearance of this crop in the general picture of cereal crops, it is necessary to remember that, in 2019, the area cultivated with oat represented 12.8% of the area cultivated with corn. The area cultivated with barley registered a minimum in 2014 (11,620 ha) and a maximum in 2016 (15,514 ha). The surface cultivated with sorghum in the North-West Region decreased by 14.3%, in 2019 compared to 2014. Rye culture owned the smallest areas of land in the Northwest Region. The smallest cultivated area with rye was only 629 ha (2017). The surface cultivated with rye in 2019, represented only 0.2% of the area cultivated with corn in the North-West Region.

In the period 2014-2019, cereal growers had at their disposal several forms of support from the state, which contributed to the encouragement of this sector of activity. It is necessary to mention the forms of support for the cereal sector: direct payment schemes; State Aid for diesel used in agriculture and Transitional National Aid 1 (ANT 1) *(https://www.madr.ro/ en/field-crops/cereals/wheat.html).*

Production of grain cereals. Table 3 shows the production dynamics for grain cereals in the North-West Region of Romania, in the period 2014-2019. Regarding the production of grain cereals, it can be seen that it fluctuated from one year to another in the analyzed interval. The production of grain cereals from the North-West Region registered a maximum in 2018 (2,895,230 tons) and a minimum in 2015 (1,702,708 tons). In 2019, the production of grain cereals represented 8.7% of the production registered at national level. The production of grain cereals from the North-West Region registered in 2019, an increase of 35.6%, compared to 2016. This increase in the production of grain cereals in the mentioned region is due on the one hand to the increase in yield per hectare and, on the other hand, to the increase of the areas destined for cereal crops.

Table 3

Dynamics of grain cereals production in the North-West region, in the period 2014-2019
(tons)

Specification	2014	2015	2016	2017	2018	2019	2019/ 2014 (%)
NORTH-WEST Region	1,955,323	1,702,708	1,977,559	2,431,034	2,895,230	2,652,989	135.6
Bihor	683,228	719,885	758,467	990,140	1,120,102	1,138,916	166.7
Bistrita-Nasaud	101,732	81,404	96,694	115,940	136,838	124,845	122.7
Cluj	308,380	221,470	297,439	298,191	441,057	361,896	117.3
Maramures	95,181	75,218	94,542	133,082	150,310	118,145	124.1

Satu Mare	640,532	494,534	599,305	720,565	856,120	742,818	115.9
Salaj	126,270	110,197	131,112	173,116	190,803	166,369	131.7

Source: Own processing based on NIS, Tempo- Online Database, 2020

Regarding the production of grain cereals made in the counties of the North-West Region, it was found a change from one year to another in the period under analysis. As expected, in Bihor county were registered the most significant productions for the category "Cereal grains". The largest cereal production in Bihor County was achieved in 2019 (1,138,916 tons). The production of grain cereals in Bihor county registered an increase of 66.7%, in 2019, compared to 2014. Bihor County, in 2019, achieved 3.7% of the grain production achieved at national level. Satu Mare County is on the second place in terms of grain production. The highest cereal production was 742,818 tons (2019). In this county, in 2019, the production of grain cereals increased by 15.9%, compared to 2014. Cluj County ranks 3rd in the ranking of counties in the North-West Region, in terms of cereal grains production. The highest production was 441,057 tons (2018). In 2019, in Cluj County we witnessed an increase in cereal grains production by 17.3%, compared to 2014. Productions under 200,000 tons were obtained in the counties: Salaj Bistrita-Nasaud and Maramures. From the data presented and analyzed regarding the production of grain cereals in the counties from the North-West Region, a common element emerges, namely, that in 2019 there were increases in all counties, compared to 2014. This has had a positive impact on the economy of the North-West Region.

In table no. 4 it is shown the evolution of the production for the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. From the presented data it was found that the cereal productions evolved differently from one year to another. An important contribution to this situation was represented by: the level of yields per hectare; climatic conditions; areas cultivated with different cereal crops, etc. The highest production was achieved for corn crops, of 1,953,648 tons (2018). The production of corn grains obtained in the North-West Region increased by 44.3%, in 2019, compared to 2014. Wheat production in the analyzed region was between 472,422 tons- 618,173 tons. Wheat production increased by 25.6% in 2019, compared to 2014. Oat production increased by 6.1% in 2019, compared to 2014, and the highest production in absolute value was 86,118 tons (2018). Barley production registered a maximum in 2018 (67,802 tons). Sorghum production and rye production are poorly expected in cereal production. In 2019, sorghum production decreased by 3.8%, compared to 2014. Rye production registered a maximum in 2015 (2,662 tons). In 2019, rye production increased by 15.2% compared to 2014.

Table 4

Dynamics for the main grain cereals production in the North-West Region, in the period 2014-2019 (tons)

Specification	2014	2015	2016	2017	2018	2019	2019/2014 (%)
Wheat-total	472,422	570,476	488,888	607,996	618,173	593,588	125.6
Corn grains	1,226,272	873,385	1,191,614	1,503,998	1,953,648	1,769,558	144.3
Oat	70,814	69,997	83,007	86,118	83,771	75,146	106.1
Barley	41,665	48,483	61,316	65,631	67,802	58,229	139.7
Sorghum	3,946	2,257	2,230	3,743	5,428	3,799	96.2
Rye	1,914	2,662	2,311	1,696	1,834	2,205	115.2

Source: Own processing based on NIS, Tempo-Online Database, 2020

Average production per hectare of cereal grains. The average production per hectare of grain cereals for the period 2014-2019, in the North-West Region is shown in table no. 5. The highest average production per hectare for grain cereals was recorded in 2018 (5,736 kg/ha). This average production per hectare realized in the North-West Region, did not exceed the average production per hectare registered at national level (5,999 kg/ha) in 2018. At the opposite pole, the lowest average production per hectare for grain cereals was 3,297 kg / ha (2015). A positive aspect in terms of yield per hectare for cereals in the North-West Region is represented by the fact that it increased by 28.0% in 2019, compared to 2014. Productivity per hectare shows the interest of cereal growers to increase this indicator which entails a number of economic advantages. Increasing the average production per hectare for grain cereals is an important goal for every farmer in order to cope better with competitive pressure. In Bihor County, the highest average production per hectare for grain cereals was 5,580 kg / ha (2019), being higher than the average registered in the North-West Region (5,254 kg / ha), in 2019. The lowest average production per hectare for grain cereals in the aforementioned county was 3,358 kg /ha (2015). Productivity per hectare for grain cereals in Bihor County increased by 42.8% in 2019, compared to 2014. In Bistrita-Nasaud County, the most significant average production for grain cereals was registered in 2018 (4,548 kg/ha), and the lowest was 2,400 kg/ha (2015). In Cluj County, the highest average production per hectare for grain cereals was 6,144 kg / ha (2018), which exceeded the average registered in the North-West Region for 2018 (5,736 kg /ha). In Maramures county, the average production per hectare increased by 19.5% for grain cereals, in 2019, compared to 2014. The highest average production per hectare for grain cereals was recorded in Satu Mare County, in 2018 (6,389 kg / ha). In

this county, the average production per hectare increased by 19.2%, in 2019, compared to 2014. In Salaj county, the average production per hectare increased by 25.4%, in 2019, compared to 2014.

Table 5

Dynamics of average production per hectare for grain cereals in the North-West Region, in the period 2014-2019 (kg / hectare)

Specification	2014	2015	2016	2017	2018	2019	2019/ 2014 (%)
NORTH-WEST Region	4,102	3,297	3,785	4,937	5,736	5,254	128.0
Bihor	3,906	3,358	3,580	4,912	5,538	5,580	142.8
Bistrita-Nasaud	3,163	2,400	2,837	3,821	4,548	4,147	131.1
Cluj	4,358	3,256	4,084	4,459	6,144	4,966	113.9
Maramures	3,531	2,719	3,285	5,106	5,209	4,223	119.5
Satu Mare	4,724	3,687	4,422	5,551	6,389	5,632	119.2
Salaj	3,486	2,881	3,332	4,587	5,053	4,372	125.4

Source: Own processing based on NIS, Tempo- Online Database, 2020

In table no. 6 is presented the evolution of the average production per hectare for the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. For wheat, the highest average production was 4,280 kg/ha (2018). For corn grains, the highest yields per hectare were recorded. In 2018, a maximum yield was reached for corn, this being 7,404 kg / ha. In 2019, the average production per hectare for corn grains registered the highest percentage increase (+44.7%), compared to 2014. Increases for the average production per hectare in 2019, compared to 2014, were registered for: rye (+33.8%); barley (+16.0%); sorghum (+ 12.2%) and oat (+ 9.4%).

Table 6

Dynamics of average production per hectare for the main cereals in the North-West region, in the period 2014-2019 (kg / hectare)

Specification	2014	2015	2016	2017	2018	2019	2019/ 2014 (%)
Wheat-total	3,843	3,891	3,380	4,255	4,280	4,040	105.1
Corn grains	4,621	3,156	4,263	5,912	7,404	6,688	144.7
Oat	2,014	1,971	2,319	2,537	2,416	2,204	109.4
Barley	3,586	3,400	3,952	4,580	4,509	4,162	116.0
Sorghum	3,049	2,804	2,816	3,122	4,055	3,424	112.2
Rye	2,387	2,331	2,304	2,696	2,650	3,195	133.8

Source: Own processing based on NIS, Tempo-Online Database, 2020

Average purchase prices. Table 7 shows the average purchase prices for the main categories of cereals in the North-West Region of Romania, in the period 2014-2019. The price for wheat varied between 0.58 lei/ kg- 0.73 lei/ kg. In 2019, the average purchase price for wheat remained constant compared to 2014, being 0.72 lei kg. The highest purchase price for corn was 0.6 lei kg (2016, 2018), and the lowest was 0.55 lei / kg (2015). For winter barley the highest price was 0.66 lei / kg (2019), and for spring barley it was 0.7 lei / kg (2017).

Table 7

Average purchase prices for the main categories of cereals in the North-West region of Romania, in the period 2014-2019 (Lei / kg)

Specification	2014	2015	2016	2017	2018	2019
Wheat	0.72	0.73	0.58	0.6	0.66	0.72
Winter barley	0.5	-	0.5	0.58	0.6	0.66
Spring barley	-	-	0.54	0.7	0.63	0.65
Corn grains	0.56	0.55	0.6	0.57	0.6	0.59

Source: Own processing based on NIS, Tempo- Online Database, 2020;
- lack of data.

In order to increase the competitiveness of the cereal sector in the North-West Region of Romania, farmers must pursue:
- ➢ increase of the average production per hectare;
- ➢ making associations;
- ➢ investments in new technologies;
- ➢ investments in order to realize the irrigation systems.

CONCLUSIONS

In the North-West Region, cereals occupy a significant area of the total cultivated area. Following the analysis of the cereals production and marketing activity in the North-West Region, the following can be deduced:
- ➢ In the North-West Region, in 2019, the area cultivated with grain cereals increased by 5.9%, compared to 2014;
- ➢ In 2015, Bihor county cultivated the most significant area with grain cereals, of 214,375 ha;
- ➢ The largest land area at regional level was cultivated with corn grains (279,496 ha), in 2016;
- ➢ The smallest areas at the regional level were cultivated with rye. In 2019, the area cultivated with rye held a share of only 0.2% of the area related to corn cultivation in the analyzed region;

- Total grain cereal production achieved at regional level in 2019, represented only 8.7% of cereal production achieved in Romania;
- The most significant production of grain cereals was achieved in Bihor county, of 1,138,916 tons (2019);
- At the regional level, the largest productions were made for corn grains;
- In 2019, the production of corn grains at regional level registered an increase of 44.3%, compared to 2014;
- The highest wheat production was 618,173 tons (2018);
- The lowest production was recorded for rye in 2017 (1,696 tons);
- In Satu Mare county, the most significant average production per hectare for grain cereals was registered, of 6,389 kg / ha (2018);
- The highest yield was obtained for corn grains, of 7,404 kg / ha (2018);
- The average productions per hectare for the main cereal crops registered increases in 2019, compared to 2014;
- The average purchase prices for the main cereals registered variations from one year to another;
- The lowest purchase price for corn was 0.55 lei kg (2015), and the highest was 0.6 lei / kg (2016, 2018).

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ASPECTS OF DAIRY CATTLE BREEDING AND IMPROVEMENT IN ROMANIA

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Abstract

Dairy cattle sector in many countries is still in focus for improving both livestock and milk production, as a necessity for increasing food demand. To achieve progress in this area, the specific conditions of each country should be considered for designing adequate strategies and programmes for improving dairy cattle breeding. The present paper shows aspects and progress related to dairy cattle effective size, milk production and advances in genomic technology use in Romania. Dairy cattle breeding and improving perspectives are provided too.

Key words: dairy cattle, milk production, animal breeding, performance control, genomic selection.

INTRODUCTION

The worldwide human population increasing number is reflected in higher necessities for food, mainly meat and diary products. Animal production yield should stand on this trend. Moreover, dairy products health and nutritional benefits imply human health issue aspects. Milk and dairy products concur to meet human needs for high-quality protein, calcium, magnesium, selenium, riboflavin, vitamin B12, and pantothenic acid (vitamin B5) (Tricarico et al. 2020).

European dairy industry directions rely on influencing factors such as growing human population, facilitated access and availability of dairy farm animals, particularly cattle and specific dairy farming climate, so that it shows for cca 22% of global milk production (EMR, 2020).

Milk industry growth is showing output increameant by 0.7% in 2018 compared to the previously year concur to dairy market of Europe, to point 226.7 million tones (EMR, 2020).

Highly specialized breeds show production traits improvoved by genetic or animal breeding means, so that animal improvement programmes need to be adapted to the current progress in various fields (Woelders et. al., 2006). Genetic make-up in dairy cattle shows a great role in milk yield and composition variation range (Kiplagat et al., 2012).

Also, sustainable intensification is a practical way to apply for improving milk production and consumption sustainability in many

countries, by means of animal genetics potential improvement, balanced feeding and local resources availability for feeding (Tricarico et al. 2020).

Dairy cattle populations and cattle breeds characterisation is very important in implementing suitable livestock breeding and improvement programmes (Hoffmann et. al., 2010). Phenotypes and genotype information related to various functional traits in cattle conduct to an adequate characterization of population and individuals and futher contributing to breeding and improvement programmes set up (FAO, 2011). Such strategies can be used and adapted for dairy cattle breeding in our country.

DNA data based genomic technologies enable large scale predictions of dairy cattle performance potential, which can be used for enhancing milk productivity, genetic improvement of cattle livestock next to heath, welfare and lowering the value of generation interval, all in an approriate herd management system (Hart, 2017).

Genomic selection enable earlier identification of elite individuals of a herd and higher efficiency in breeding pair sellection by means of breeding indices contributing to estimate breeding values next to multiple traits information in order to provide an efficient deccision making and breeding management plan based on the selected and ranked reproducers furfilling best selection criteria (Hart, 2017).

Considering that the breeding objective for dairy cattle is still a concern and there is no single objective wich can be used as best fitting for all cattle populations (Cole, VanRaden, 2017), different countries should define and addapt in this regard appropriate breeding solutions for an efficient dairy cattle management.

The present paper provides an overview related dairy cattle breeding including genomic selection, showing aspects and priorities to be considered for cattle breeding in Romania too. New strategies are still demanding for livestock improvement addapted to our country specific conditions in dairy cattle.

MATERIAL AND METHOD

The present study analyzes dairy cattle data recorded in Romania to draw up an overview and new perspectives for breeding and improvement purposes. It include data collected from dairy cattle farm holding from the field and reported by all County Animal Husbandry Offices, centralized by The National Agency for Animal Husbandry „Prof. dr. G. K. Constantinescu".

Data presented referred to breed category at national level related to the effective number of cattle dynamics and also under performance control for milk production. Reports of The National Agency for Animal Husbandry

„Prof. dr. G. K. Constantinescu" and of the Ministry of Agriculture and Rural Development were used to generate the situation of dairy cattle breeding at national level.

The paper is an assessment of the actual status in dairy cattle breeding sector in Romania, carried out to point some relevant aspects to consider for dairy cattle development and management, considering other European achievements in this area.

RESULTS AND DISCUSSION

DAIRY CATTLE OVERVIEW IN ROMANIA.

The Ministry of Agriculture and Rural Development, throughout its institutions and regional departments, in agreement to other current European regulations and also to national specific programmes, aim to inventory and stimulate breeding and improvement of dairy cattle populations. The National Agency for Animal Husbandry „Prof. dr. G. K. Constantinescu" is the main authority of the Ministry of Agriculture and Rural Development enrolled in genetic animal resources improvement, by implementing specific feasible strategies and programmes.

Cattle population has been on a decline from 2.9 million heads in at the end of 2006 to 1.9 million heads at the end if 2011. Milk production was in the same line with cattle effective number, shoing a decline from 5.45 billion liters in 2007 to 4.37 billion liters in 2011 (USDA, 2013).

Table 1 shows the dynamics of total bovine effective number and milk production during 2001-2013 in Romania. By analyzing this data extending over a thirteen years period (MADR, 2020), it reflects the necessity to improve bovine sector both related to livestock effective size and milk production; specific climate and conditions of various regions should be considered in specific breeding and improvement programmes.

Table 1

Dymanics of total effective and milk production in bovine in Romania during 2001-2013

Year	Total effective no. (thousands heads)	Average milk production (l/head)
2001	2.800	3.014
2002	2.878	3.133
2003	2.897	3.263
2004	2.801	3.493
2005	2.862	3.510
2006	2.934	3.688

2007	2.819	3.564
2008	2.684	3.653
2009	2.512	3.807
2010	1.985	2.595
2011	2.130	3.529
2012	2.164	3.417
2013	2.197	3.385

*data acording to the Technical report - operative on bovine herds at 30 June 2017 availabale of the Ministry of Agriculture and Rural Development (MADR, 2020)

In the last five years we can ascertain a maintain and a slight increase related to bovine effective size under performance control in Romania, proving a progress made in dairy cattle breeding sector, even if the value of 296655 recorded in 2020 (ANZ, 2020) still need to be raised up.
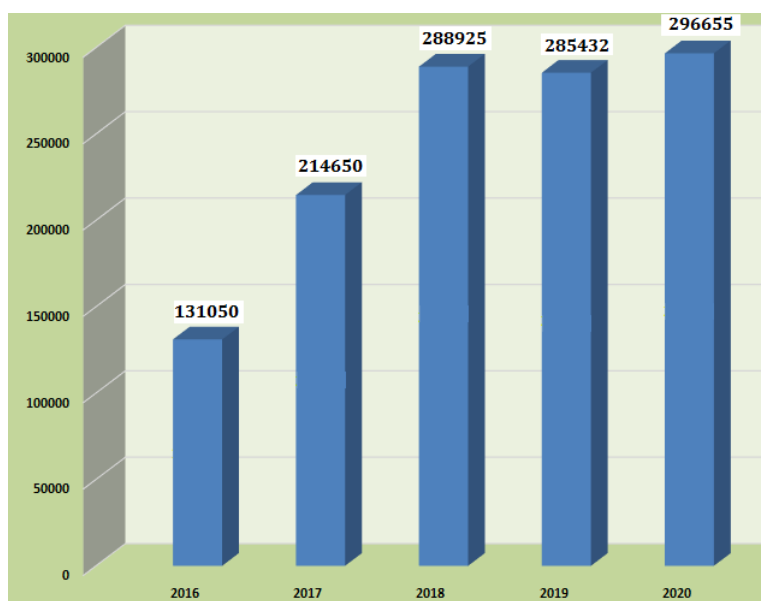
Fig. 1 Dynamics of bovine under performances control in Romania during 2016-2020
(including buffaloes)
*data acording to the Technical bulletin report in bovine species at 31.03.2020 for the first quarter of 2016-2020, of The National Agency of Animal Husbandry(ANZ, 2020)

Values presented in table 2 are showing that Romanian Spotted Cattle – Simmental is the main cattle breed in our country for milk production and that a relevant progress was made regarding the effective number included in performance control for milk production. The other breeds under performance control are important too.

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Table 2

Effectives of dairy cattle under performance control for milk production in Romania

Breed	Breed symbol	No. of bovine milk breed under performance control for milk production
Romanian Black Spotted Cattle - Holstein-Friesian	B.N.R.-H.F.	11.5173
Romanian Spotted Cattle – Simmental	B.R.-SIM.	153.308
Montbeliard	M.O.	3.211
Brown Cattle	B.	15.907
Pinzgau	P.Z.	3.207
TOTAL		290.806

*data acording to the Technical bulletin report in bovine species at 31.03.2020 of The National Agency of Animal Husbandry (ANZ, 2020)

Dairy cattle populations from other countries (Boichrad et al., 2016; Meuwissen et. al., 2019) and Romania are valuable livestock, requiring a special interest for farming and animal improvement, but also for genetic conservation.

The valuable characteristics of Romanian breeds, like resistance and excellent adaptability to specific housing conditions, demand strategies for adequate breeding and improving systems throughout specific programmes. The financial support stimulated farmers in dairy cattle sector and should be further considered to ensure future progress.

DAIRY CATTLE OVERVIEW IN OTHER COUNTRIES. TRENDS AND PERSPECTIVES.

Genomic selection shows a wide use in dairy cattle industry and also for dairy cattle livestock improvement (Yadav et al., 2017). In developed countries the use of genomic selection resulted in increasead rates of genetic gains and number of genomic assessed young bulls for dairy breeding (Mrode et. al., 2019). Other countries which are still in development need to find out and implement strategies for specific small holder farm systems with small livestock populations, collection and data recording related pedigree, genetic evaluation, next to adequate breeding structures, programmes and breed associations or other type of organizations (Kosgey, Okeyo, 2007, Carvalheiro, 2014, Brown et al., 2016, Silva et al., 2016, Mrode et. al., 2019). Genomic selection is widely used to improve specific traits in dairy cattle associated with production yield and quality, animal heath, udder health and conformation of indiviuals.

The first place related genomic selection use in dairy cattle over the world is assigned to Australia, followed by USA, Canada, China and other

European countries (Yadav et al., 2017). In this context, worldwide the Eurogenomics harboring the Netherlands, Germany, France, the Nordic countries, Spain, and Poland; The North American, harboring USA, Canada, Italy) and Great Britain; and a "rest of the world" consortiums were settled for ensuring a collaboration for enhancing the use of genomic selection in dairy cattle (Yadav et al., 2017).

Table 3

Number of dairy cattle breeds genotyped for genomic prediction purposes in USA and France

Country	Total no. of dairy cattle genotyped	Breed	No. of dairy cattle genotyped
USA	2,000,000	Holstein	934,780
		Jersey	120,439
		Brown Swiss	19,588
		Ayrshire	4,767
France	360,000	-	-

data according to Wiggans, personal communication referred in Meuwissen et. al., 2019 and Boichrad et al., 2016.

Heifer calves are rather prefered for genotyping in many countries, even if young bull calves genotyping is showing increased genetic gaing. Also, genotyping is enough cheap to be applied for choosing heifer calves and bulls to be retained and furhter used for mating in dairy herds (Pryce, Hayes 2012; Hart, 2017).

Nowadys DNA chips for genotyping over 54,000 single nucleotide polymorphisms (SNP), next to mixed HD and LD high accuracy genotyping chips are available and used in many approaches (Mrode et. al., 2019).

Lately, following the example of other countries, specific programmes and stategies were made and implemented in Romania aiding to start up genomic assement in our country too, so that genomic data concur for estimating acurate breeding indices for dairy cattle breeding. However, progress is still needed to extent the use and implement such technologies in dairy cattle in our country.

CONCLUSIONS

In our country, specifically in dairy cattle sector, following the example of other countries and considering our specific conditions, some progress was recorded, but we still need to make efforts to find out solutions for efficient and satisfactory performance and pedigree recording also by using genomic evaluation, in breeding and improvement programmes.

Market growth for dairy products and the increasing demand for traditional milk products come to support the development of dairy cattle sector in Romania towards dairy cattle breeding and farming.

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MATHEMATICS APPLIED IN THE PRODUCTION ACTIVITY

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Abstract
In this paper we analyse the production costs and the calculation of the profitability of a product obtained in the production process.The production cost of a product is given by two main components: the cost of the raw material from which the product is made and the adjacent costs consisting of wages, rents, maintenance costs, packaging and others.
The analysis refers to the product vertical blinds used in covering windows, having a dual role of replacing curtains and drapes. For the calculation of profitability, production costs and profitability analysis, we use the Excel program. We use our own costing formulas and a mathematical model based on the software mentioned above. Taking into account the price of the product on the market as well as the total manufacturing costs of the product, we will calculate the quantity that must be produced monthly by two people, in order to be profitable production.
We will analyze the incipient situation of two people, who are launching on the market with a single product: vertical blinds.

Key words:product, production process, costs, profitability

INTRODUCTION

Vertical blinds are an efficient product for covering windows, especially in office buildings, institutions, where they have the role on the one hand to replace the classic curtains and sun curtains, which are not suitable in such places, and on the other part of obtaining an ideal comfort of the space, by the fact that by rotating the slats and handling them, you can determine the brightness of the room, depending on the time of day.

MATERIAL AND METHOD

We calculate the profitability of a manufactured product, using data related to consumption, price, cost from formulas created by us. The calculation is designed according to the set of raw materials needed to produce vertical blinds.
The product consists of two main elements:
1. The textile material which is calculated per square meter depending on the width (L) and height (H) of the blindFig. 1.,is made of 13 cm slats, which overlap 1.6 cm on top of each other so as to completely opaque at the time of closing.

The calculation method is: at a size of L = 230 cm and H = 150, we first calculate the number of slats needed. Then corroborating with the height, we will find the linear meters used. Calculation:L - 2cm (representing the control unit) / 11.4 (size of the spacers connecting the slat support trolleys) = 20 pieces of slats;

20 slats • 1.53 (representing the height of 150 cm of the blind + 3 cm required for gluing the material) • 1.02 (representing the loss of material due to defects or roll ends) = 31.21 ml, as in Fig. 1.

At 3.45 sqm (2.3 • 1.5) we actually use 31.2 ml of textile material, which at a cost of 0.2 euro / ml, means 6.2 euro, so 1.8 euro / sqm.

Fig. 1.Calculation of the textile material used

Fig. 1. The material support rail with its components is calculated according to the width of the blind Fig. 2.

Fig. 2. Calculation of required components (rail and accessories)

The rail consists of several subassemblies: the rail as such, the inner shaft, spacers that hold the carriages together, the carriages that support eachlamella separately, the counterweights that have the role of holding each lamella stretched, the lower beads that connect the lamellae, the control unit which opens or closes the blind, the beads on the control unit which rotate the slats, the actuating cord which closes or opens the blind.

Calculation for components:
a) Rail = L • 1.05 (percentage of loss by cutting); 230 cm • 1.05 (percentage of loss) = 242 cm = 2.42 m; 2.42 m • 1.3 euro = 3,146 euro
b) Ax = L • 1.05 (percentage of loss by cutting); 230 cm • 1.05 (percentage of loss) = 242 cm = 2.42 m, 2.42 • 1.1 euro = 2,662 euro
c) The trolleys are calculated by dividing L by 11.4 (size of the spacers that connect the slats support trolleys) = 230-2cm (control unit) / 11.4 = 20 pcs, 20 • 0.25 (price) = 5 euro, as in Fig. 3

Fig. 3 formula bar: `=IF(AND(C9>0;C16=0;C17=0);ROUNDUP((C9-2)/11,4;0)*C25+IF(AND(C9>0;OR(C16>0;C17>0));ROUNDUP((C9-2)/8;0)*C25`

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	A	B	C	D	E	F	G
1							
2		**CONSUMPTION VERTICAL BLINDS**					
3							
4		NO TOTAL PIECES	12				
5		TOTAL SQUARE METERS	60,1				
6		AVERAGE COST / sqm	7,0				
7		AVERAGE MP / PC	5,0				
8							
9		WIDTH	230		WIDTH	100	W
10		HEIGHT	150		HEIGHT	300	HE
11		CORD HEIGHT	140		CORD HEIGHT	200	CC
12		OPEN. CENTRAL			OPEN. CENTRAL		OF
13		INCLINED			INCLINED		IN
14		H MAX			H MAX		H
15		H MIN			H MIN		H
16		LATIME 89			LATIME 89		LA
17		PVC 89			PVC 89		PV
18		BRACKETS			BRACKETS		BR
19							
20							
21		NECESSARY TEXTURE	31,21		NECESSARY TEXTURE	111,26	NE
22		INCLINED TEXTURE	0,0		INCLINED TEXTURE	0	IN
23							
24		MATERIAL	KISS 409		MATERIAL	PRAGA 735	M.
25		PIECES	1		PIECES	4	PII
26							
27			TEXTURE PRICE /sqm	TEXTURE COST		TEXTURE PRICE /sqm	TEXTURE COST
28			0,2	6,2		0,2	22,3
29		CONSUMPTION	PRICE	COST	CONSUMPTION	PRICE	COST
30	shaft	2,42	1,1	2,662	4,2	1,1	4,62
31	trolleys	20	0,25	5	36	0,25	9
32	trolley with magnet	1	0	0,4	4	0	1,6

Fig. 3.Trolley consumption formula

d) For the calculation of the lower beads we use the formula presented below (Fig. 4), resulting in a consumption of 5.46 ml. Their price is: 5.46 ml • 0.1 euro = 0.546 euro.

Fig. 4 formula bar: `=IF(AND(C9>0;C16=0;C17=0);(B36/C25*2+2)*13/100;0)*C25`

Fig. 4.Beads consumption formula

e) Hangers are calculated as follows as in Fig. 5:

Fig. 5 formula bar: `=IF(AND(C16=0;C17=0;C9>0);ROUNDUP((C9-2)/11,4;0)*C25`

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Fig. 5. Hangers consumption formula

a consumption of 20 pieces is obtained, which is multiplied by 0.6 euro, which leads to costs of 12 euro

f) The control unit whose formula is exemplified below, brings costs of 0.35 euro / piece, which depends directly on the cell C25 (Fig.6), which represents the number of finished pieces of the product vertical blinds
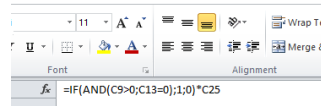

Fig. 6. Consumption unit order formula

We have presented the calculation of the most important components, for three different textile materials, the number of pieces varies from 1.4, 7.The costs related to them, expressed in euro are obtained by summing column D, as inFig. 7.

Fig. 7. Cost / components formula

We will calculate an average cost for the production of 12 pieces vertical blinds

- square meters produced L x H x B as in Fig. 8.

Fig. 8. Square meters used formula

- the average cost per square meter is 7 euro / sqm, which represents the arithmetic average per square meter of the 12 exemplified products as in Fig. 9

Fig. 9. Average cost / sqm formula

The market price of the product is 10.5 euros + VAT, which means that you can work with a commercial addition of 50% (7 • 1.5 = 10.5 euros / sqm), which is an addition of 3.5 euro / mp. In order for the activity to be profitable, we calculate how many square meters the two entrepreneurs have to produce, in order to cover the production costs and the adjacent ones (C + Î + S). We consider the rental costs marked with C, 500 euro x 4.9 lei = 2450 lei / month, maintenance marked with Î (electricity: 300lei / month, gas: 667 lei / month, water 100lei / month), salaries marked with S (4250 lei x 2 people = 8500 lei / month). It is necessary to cover the expenses a production of 817.37 sqm of production, as in Fig.10.

327	**Production in sqm to cover expenses**			
328				
329	Wages	8500	Addition / sqm	17,15
330	The water	100	Production required	817,32
331	Electrical current	300		
332	Gas	667		
333	Rent	2450		
334	Other expenses (consumables, packaging)	2000		
335	Total expenses	14017		

Fig.10. Production in sqm to cover expenses

RESULTS AND DISCUSSION

Production required to maintain activity			
Wages	8.500	Target of additional income	18500
The water	100	Production required for additional income of 18500 lei	1078,71
Electrical current	300	Operating profit (lei)	4483
Gas	667	Profitability rate (%)	8,08
Rent	2.450	Turnover required to obtain the rate of return	55.500
Other expenses (consumables, packaging)	2.000	**Expenditure on raw materials**	**37000**
Total expenses	14.017	Average of a blind (sqm)	5
Production required to cover expenses (sqm)	817,32	Execution time (min)	30
No. of pieces required to execute / month (pcs)	164	No. of pieces required to execute / month (pcs)	216
Turnover required to cover expenses	42.051	Total execution time (hours)	108
Expenditure on raw materials	**28034**	Product sale price	51,45

Fig.11. Profitability calculation (the prices are expressed in lei)

After the monthly analysis of expenses, (Fig.11.) we proposed a target that brings a gross profit of 4483 lei / month, which represents 8.08% of turnover.

To obtain this profit, we have to execute a number of 1078.72 sqm per month. The calculations are made for the price "at the factory gate", not taking into account any transport costs.

CONCLUSIONS

Of course, production is a much more complex activity than we presented in this material. Entrepreneurs must have working capital, equipment, sales market, but we did not intend to go into all the details necessary for a production activity, because this is not the purpose of the work.

The purpose of the paper is to present the usefulness of mathematical calculations and the Excel program in the production process, and in the example given here are presented the minimum knowledge needed to initiate such an activity.

So two entrepreneurs who have production equipment, have the amount of 42051 lei, necessary for the purchase of raw materials and maintenance costs, must have a market to produce at least 817 sqm of vertical blinds, everything that is above this amount, brings profit.

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