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Integronic alimentation through whole natural food biodiversity, in relation with altitude Gradation

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Abstract

The study analyzes food and alimentary act in relation with altitude gradient, from the perspective of multiple integrations, as a consequence of the coexistence of integrated agricultural and food systems, that concomitantly manifest on direction of environment - organism, as well as at intra organism level up to molecular level. The paper puts into evidence the nutritional systemic and dynamic complexity by defining the concept of integronic alimentation, respectively by analyzing a matrix system that may bio structurally comprise nutritional and environment factors, and functionally base on the process of emergent integronics. This approach proposes to profoundly understand the quality of the mountain and pre mountain food, in comparison with the plain one and that one from wet zones, through consideration of nutritional profile and evaluation of food resources (nutritive, health generating, energetic, quality-price etc.), in relation with the metabolic stress of modern alimentation and of the specific food in fragile zones.

Key words: alimentation, biodiversity, altitude gradient, integronics, food matrix.

Motto: "Tell me what you eat, so that I may tell you who you are"
"Der Mensch ist was er isst" (Man is what he eats)
[German proverb]

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1. Introduction

The interference between alimentation and culture is to be seen all over the history of mankind, alimentation being determined by natural environment, by economic and social structure of communities, by religious and spiritual conceptions, by paradigms of collective mental. Axed on physiologic dimension, especially as a bioenergetics and informational support, the alimentary act has evolved in function of cultural contexts. Alimentation, with its ritual codes, means to put into action symbols known by the whole community (Eliade, M., 1992, Levi Strauss, Cl., 1995, Dunca, 2003).

In alimentation, the preparing manner reflects the level and type of civilization with the whole complex of intercultural variables, determined by ecologic and economic, biologic and technologic conditions, as well as the system of beliefs.

From the technologic perspective of the alimentary act, food is the carrier of utilities that serve man through: entrances of nutritive substances -S- (with plastic role and of organism growth and recovery), by entrances of energy -E- (energy brought by food, being in fact an essential element of metabolism, but also of the energy necessary to society), as well as receiving information –I– (through genetic code, sensorial values of food and others). There is practically combined nutrition with metabolism, especially from epigenetic perspective, respectively at DNA level, aspects that are directly or indirectly influenced by environment factors (Uekawa A. et al., 2009), especially by alimentary profile at food level and gastronomic profile at menu level, but also at the level of overall integration on the axes man - food - environment. All these are possible under the conditions in which, in fact, man is an open informational system, with self regulation and anti entropic evolution, who processes exogenous and endogenous information (Barnea and Calciu et al., 1979; Bertalanffy, 1962; Choi and Frisco Simonetta, 2010; Gruia et al, 2002; Keyes MK. et al, 2007).

In this context, starting from the idea of the relation between nutrition and metabolism, there may be analyzed all biochemical and energetic transformations that take place in organism biostructures (Macovschi, E., 1984) through the complex process of nutrition, in relation of multiple integration: with environment factors and, respectively, with the organism itself. The natural result is nutritive equilibrium and emergent dynamics (Emmeche, 1997) for life maintenance, estimated at the level of food matrix. Energy necessary to biosynthesis processes mostly comes from the separation of macroergic links of different compounds. In function of the capacity to produce energy, heterotrophic organisms (that assure their food using synthesized substances of organisms) are those that apply an integronic food / nutrition [Gruia, 2014]. We are speaking about a system of nutritional processes, of different types of food, of multiple integration, of metabolism, respectively of catabolism and anabolism that unfold through a succession of many chemical reactions: hydrolysis, hydrogenation, dehydratation, decarboxilation, dezamination, transamination, estherification, condensation, polymerization and others. (Cristea-Popa Elena et al 1991, Menciniciposchi et al, 2012).

Taking into consideration those mentioned above, as well as taking into account exterior and interior factors of the organism concerning the feeding process, the complex notion of „alimentation” expands in fact on the axes „agriculture – food industry – culinary production”, but also in relation with natural environment and with demographic and social evolution in the decades to come and on the axes of „eco-bio-geo” principle [Bogdan and col., 2014 a, b]. All these induce the hypothesis of solving a complex and/or hyper complex system, by taking into consideration the phenomenon of food integration in relation with the organism, but also with the environment, at all levels and in all directions. We are speaking thus about the coexistence of integrated food systems, that concomitantly manifest, both at the level of the whole organism in relation with the environment and at intra organismic level, up to molecular level. We consider such an integration with a potential of maximum efficiency and harmony (on integronic principles) to be on the line of integral natural food, taking into account their compositional complexity and the constructive metabolic reactions as an organism impact.

On the other hand, a number of researches made all over the world have proved a direct link between alimentation and the stress phenomenon, as well as between nutrition and the incidence of degenerative metabolic diseases, in fact „diseases of civilization”, such as: cancer, cardiovascular diseases, diabetes, obesity, rheumatism etc. (Barnea and Calciu et al, 1979; Cristea-Popa Elena et al, 1991). The context is sustained by the idea that human metabolism (not changed in essence for millions of years) in modernity comes into contact with a series of contaminating additives, with which it is not used, producing strong metabolic disequilibrium. The consequences of renouncing at Natural whole foods in favor of those processed are obvious in the growth of the cases of metabolic syndrome. One of the problems of the processed food is the one that, during processing, there are put aside a lot of
nutritive substances, which imposes to technologically rethink and refocus, because it is clear that, economically, one cannot give up this type of food. On the other hand, integral means not processed, not treated, it means natural, a hundred per cent (bio or eco products that do not contain harmful E-s, food preservatives, colorants or artificial sweeteners). Thus, integral food, no matter which one, keeps intact all nutritional properties and brings to organism a large contribution of nutritive substances, even if we do not eat much, and help organism and metabolism to function normally, feed and detoxify.

Usually, the term of integral alimentation is assigned to fruit, vegetables and integral cereals, but it may be expanded to products of animal origin and especially to those coming from mountain zone. Only natural and integral proper food has this power to support life, NOT synthetic vitamins or multivitamins, neither medication. As a general objective that we propose ourselves is the elaboration of a model that may systemically regard nutrition and the alimentary act, in an integrative dynamics and, through a new approach, to synthesize the thoroughgoing study to understand this complexity. The concrete aim is to understand the dynamics of these connections under the context of harmonizing our genetic patrimony with the food matrix, by using especially natural or minimally processed integral food, in relation with the biorhythm (chrono nutrition) and with geographic altitude, i.e. reference elements concerning time and space in the alimentary act.

2. Material and methods

Methodologically, the scientific demarche is based on the concept and principles of integronic alimentation capable to differentiate, through distinct matrixes, the problematic of feeding, with aspects referring to processes from the interior and the outside of the organism and to quantify the complexity of this process for the harmonization and equilibration of nutritional factors. The stages of the research impose first of all the elucidation of the aspects of alimentary profile through the system of food matrixes at organism and integration in the environment level and then those linked to the gastronomic profile on the intrinsic direction of biorhythm and the extrinsic one of the altitude zone.

In the harmonization of nutrition with the metabolism of the individual, with food characteristics of different populations and the impact of the environment factors, we base ourselves on systemic approach techniques and integronic dynamics (Gruia, 2000, 2002). The analyses of such complex systems presupposes to take into consideration the Substance (matter), Energy and Information, both in the relation Environment - Economy (inclusive in food production), and in the relation Man-Environment and Man-Food. These interconnections may be achieved by considering integration dynamics as a methodology in itself, which becomes an application of the Theory of Écoemergent Integronics (Gruia, 2009). Thus, emergent integration (in expression of integronic eMergy), being in relation with Information (I) associated to Energy (E) is capable to induce in systems certain complementary tridimensional processes: synchronic, syncretic and synergic (S^3), having emergency (emS^3) as a resultant and, at systemic level, ecoemergency (ecoemS^3).

3. Results

In the analyses of the integration mechanisms it is necessary to know integration elements, both on the line food-processing - organism, and environment – alimentary act - organism. On the first direction, in order to approach integral natural food in comparison with the processed one, it is very useful the nutritional profile of the food, that may be expressed by different indexes: of nutritional density, of caloric density, glycemic index or charge, antioxidant score, aterogenetic index, alcalynizant or acidifying biochemical profile [Mencinicopschi et al, 2012]. In the case of processed food, of composite food, nutritional profiles are completely modified and different face to nutritional profiles of integral natural food. This, in our opinion, presupposes another type of analyses, based on structuring in matrixes with components of nutritional and environment factors.

At the basis of the analysis of the nutritional profile and of the food matrixes there are nutritive factors in order to ensure life, respectively: proteins, lipids, carbohydrates, mineral salts and vitamins. If we take into consideration the fact that all these are formed of simpler substances, the number of well individually characterized and necessary to organism compounds raises to approximately 70 – 80, but from which 23 – 25 amino acids, 20 fat acids, 6 oze, 15 – 20 mineral elements, 12 – 13 vitamins [Cristea-Popa Elena et al, 1991]. There are nutritive factors that in nature do neither exist under a pure form, nor singular ones, but only in certain associations that constitute aliments.
The nutritional density index is expressed by natural content—equilibrated in macronutrients—i.e. proteins (profile equilibrated in amino acids); lipids (profile equilibrated in fat saturated, mono no saturated, poly no saturated acids); carbohydrates with rapid release, slow release (with glycemic index—GI and glycemic charge—GL moderate—small), daily consumption recommended under 40 GL. The equilibrium, too may be analyzed at the level of micronutrients: macro elements (Ca, P, Mg, K, etc.) and microelements (Se, Zn, Cu, etc.), hydro and fat soluble vitamins, as well as phyto chemical non-nutrients: tannins; carotenoids; flavonoids; phyto estrogens; glucosinolats (Cristea-Popa Elena et al, 1991; Mencincopschi et al, 2012; Uekawa A. et al. 2009).

On the second direction of analyses of integration processes, besides metabolic aspects at organism level, the alimentary act is conditioned, as it has already been mentioned, by the complex of intercultural variables determined by ecologic and economic, biologic and technologic conditions. Complementarily: food, organism and environment with all its complexity, impose the idea to define the feeding act in a holistic manner, through the unitary and coherent concept of integronic alimentation. This represents the scientific demarche that studies integrated alimentary systems (pursuant to their coexistence) and the integration processes in the idea of the dynamic equilibrium, having in view epigenetic and of alimentary profile and/or gastronomic profile elements, at individual or population level, considering synchronic or syncretism the dynamics of the alimentary act, based on emergent and synergic integration (Gruia, 2014)

Accordingly, the integration directions in the case of integronic alimentation are: (a) at individual level through organism alimentary matrix based on alimentary profile and on gastronomic profile and (b) at super individual level through environment-food-organism integronic matrix.

At organism level, it must be précised that there have been registered major progresses in understanding system biology, at the impact of the environment factors and especially of the nutritive ones upon organism, mainly of the complex interaction between its components: genome, transcriptom, proteome and metabolom (Barnea, M., Calciu, Al, 1979; Dunn and Ellis, 2005; Gilbert and Sarkar, 2000; Lei et al, 2011; Patti et al, 2012; Veenstra, 2012).

In order to achieve a scientific demarche on the direction of integronic food, we are referring to combination through multiple integration of the organism, on the bases of gastronomic profile, with ambient factors (example of business environment) and with the environment factors, in the idea of decoding alimentary symbols such as, in fact, the integronic matrix organism-food-environment (fig.1).
At the level of natural environment, a series of factors have a direct or indirect influence, among which the most important are:  

- **anthropic factors of the climate**: man’s activities that contribute to climate modifications (clearances, drains, irrigations, atmosphere pollution);  
- **ecologic factors**: capable to influence organism life;  
- **(physical, climate and hydric) a biotic factors**: relief altitude, gradient, exposition;  
- **geomorphologic factors**: relief altitude, gradient, exposition;  
- **edafic factors**: soil with physical, chemical and biological properties;  
- **biotic factors**: phytocenotic, zoocenotic and biocenotic interrelations [Gruia, R. et al, 2002].

**Gastronomic profile** (or food holistic quality), includes a series of basic principles and elements, among which we mention:  
- nutritional and alimentary profile;  
- alimentary diet (physiologic necessary, biorhythm, way of life);  
- menu structure on categories of consumers;  
- culinary constructivism (design, hedonic attribute) [Gruia, 2014].

At super individual level, complex connections between biochemical elements of aliments in relation with interaction between environment, food and organism induce the idea of *multiple systemic integration*, forming what we could call an *integronic matrix* necessary in nutritive equilibrium for the maintenance of the life of animal world organisms, through the processes of fundamental metabolism.

Within the concept of integronic alimentation and of biostructurality, there may be observed that individual variations, as a result of the impact of integronic dynamics, are basically totally given by environment (E), the genotype (G) practically remaining unchanged [Gruia, 2000; Keyes et al, 2007]. The nutritive equilibrium especially changes because of certain temporary differences given by aspects linked to time (as, for example, biorhythm) and space (as, for example, altitude). *The integronic matrix environment-food-organism* may be affected by a number of environment factors, from which the most important are those linked to aliment typology (integrated natural food and processed food), but also by the intensity of activity, age, sex, health estate, the size of the analyzed group and others.

### 3.1. Integronic food on the direction of nutrigenomics and chrononutrition

The natural rhythm of the organism secretes enzymes and hormones necessary to the decomposing of the food we are consuming in a very calculated and organized manner in function of genetic coordination and of the period of the day when we eat. Nutrigenomic talking about identifying and understanding molecular-level interaction between nutrients and other dietary bioactives with the genome. Consequently, through the consumption of specific aliments, at the moment when it is the most useful that these ones should be consumed, it indicates what aliments should be put away in other moments of the day. Applying the principles of *chrono nutrition* there are opened directions of optimized integration in the alimentary act, and those already suffering from metabolism illnesses may reduce the level of cholesterol, triglycerides, glucoses and arterial pressure.

Individual biorhythms show us which are the hours when internal organs function at their maximum capacity, through the *principles of integronics*, these ones being harmonized with aliment biorhythms, which are the more accentuated the less they are processed and well put into evidence in the case of the biodiversity of natural integral aliments (‘alive’*) with a high nutritional quality, i.e. *nutritional profile* based on a series of indexes with very good parameters. We precise that we may have degrees of different integration in function of the processing degree, criterion through which we distinguish:  
- integral natural aliments (fruit, vegetables, fresh Wallnut, etc.);  
- }
minimally processed aliments (fruit, refrigerated, frozen vegetables); - processed and highly processed aliments (pastry and confectionary products, snacks, chips, fast-food, margarine, refined sweets and sweet products, cold cuts, white bread, etc.), with outbalanced nutritional profiles.

Food is the major carrier of information taken over from environment. This information of food interacts with our own genetic information - condition absolutely necessary good for the well functioning of the biologic entity "Man" (Mencinicopschi et al. 2012). Under this context, the process of emergent integration is made through processing the information environment-food by the organism, by two major ways: the nervous system and the cell metabolism. Thus, there is in fact processed the information of the alimentary matrix, achieving both the integrality of the whole system, and also its adaptation at the changes of the environment, these ones being underlined, as it has already been précised, by the new branch of the nutrition and genetics - nutrigenomics.

In order to harmonize all these elements, with an impact over every organism, it is known that, in the case of composite food, to make a menu corresponding to the principles of scientific alimentation on the basis of the gastronomic profile means in fact to find modalities to cover the physiologic necessary for a certain category of consumers. Thus, the menu is achieved through alimentary products or varied, nutritively corresponding preparations, with psychosenzorial characteristics that may attract the consumer by a taste harmony, with satiety power and that may prevent the apparition of hunger sensation for 4-5 hours. In this situation, integration elements are more evident, both at the metabolism level, as it has already been analyzed, and at the level of alimentary biodiversity and adaptation at the environment (including taking into account geographic conditions, as, for example, altitude).

### 3.2. Integronic food in relation to altitude gradient

Among geomorphologic factors, we consider that relief altitude, being also linked to the type of flora, of fauna and of cultivated agricultural species or of farm animal species, differentiates consumers from the alimentation point of view. The typology of the alimentation in function of altitude puts into evidence a series of differences in the area of Romania, which practically detains all forms of relief, with altitude between 0 and 2500 m, as it results in table 1, in a bibliographic synthesis after Alexa, I., 2009 [e-Bibl.-1] and Panait, G, 2011 [e-Bibl.-2].

Table 1. Orientative gastronomic profile, in relation with altitude gradient

| ALTITUDE GRADIENT                  | DIET IN FOOD ACT                                                                 |
|------------------------------------|----------------------------------------------------------------------------------|
| Alimentation at very low altitude  | At very low altitude we start from a premise that caloric requests are not significantly changed face to those from the lowland, at least during the hot season. The lipid need is not increased, on the contrary, it may be slightly reduced, the extra being added by carbonate hydrates. During the cold season, it is taken into consideration a slight increase of fat substances, necessary to thermoregulation. There is added the liquid ratio (approximately 1500 ml/24 h) and the contribution of mineral salts (ex.: by juices, fruit, vegetables etc.). As for chrono nutrition, food repartition over 24 hours is recommended to have the following proportions: about 20 % at breakfast, 30-35 % at lunch, 25-30 % at dinner and 10-15 % for the rest of the day (snacks). The caloric ration for 24 hours should be of 40-45 calories per kg/body. There will be avoided the consumption of cold drinks and food after an effort. The meal will be served at least 30 minutes after physical effort. In general, except for situations linked to physical effort, alimentation (except for that one during cold season) keeps appropriate characteristics to home-made one, from lowlands, both as for the caloric necessary and their repartition along 24 hours. At little altitude it is noticed an increase of basal metabolism, accelerating organism burnings and, therefore, claiming for an extra energetic contribution in order to be able to face new climate conditions. It is appreciated a necessary of 50-55 calories kg/body during the hot season and of 55-60 calories per kg/body during the cold season. The liquid ration may be up to 2000 ml, consisting of milk, fruit juice, meat soups and vegetables. The mineral ration will be covered from vegetables, pickles, natural salads, natural juice, fruit, and dairy products. Alimentation during effort (in excursions) will be mainly liquid (tea, coffee, fruit juice). It is not recommended to consume large quantities of liquids at once, neither water, they not being able to compensate alone organism spoliation of mineral salts, which happens at the same time water is eliminated through perspiration. For the cold season, the mentioned daily ration will increase a little bit in lipids, butter, cream, eggs, cheese, dairy products being preferred, as well as carbonate hydrates (pasta, fruit jam, sweetness, honey etc.), proportionally reducing the protein rations, without going down under 1-1,5 g proteins per kg body weight. As for drinks, losses generally being less than in summer and these ones caused by effort, liquid ration will be an average of 1500-1800 ml/24 h and there will be preferred hot drinks (tea, coffee, boiled milk, soups etc.) The evening alimentation will not contain borsches or soups (preferring only at lunch), heavy food, sauces, spicy mincemeat etc. Evening ration will of preference be hydro-sugar, rich in raw food and with very little meat (veal,
poultry), with dairy products, fruit or juice, tea and lemon. In general dinner will precede sleep with at least 2 hours, being recommended that before it a little movement should be made (a stroll, when weather allows it, and then to participate at certain amusing activities).

**Alimentation at medium altitude (500-1600 m)**
At medium altitude, increased requests that this climate imposes the intensification of catabolic phenomena (of dezassimilation). Face to these considerations there is reached a caloric necessary per kg/body of about 60-65 calories. Alimentation will be balanced, excess not being indicated, but also abuse consumption of alcohol (just a glass of beer / red wine, especially for dinner).

**Alimentation at high altitude (1600-2500 m)**
At high altitude it is necessary a special attention because height determines certain increased alimentary requests face to alimentation from lowlands. The content of the meal at a climbing of over 2000 m may have the following content: "50 g of hard cheese, 100 g flat-bread / 20 g honey/ 20 g chocolate"

During activities at high altitude one loses weight (a few kilos), which shows a total caloric deficit (up to 2000 Kcal/day).

The process of integration of alimentation on the territory of Romania is going on at the same time vertically, i.e. altitude zones, and horizontally, i.e. on historical and territorially-administrative zones, analyses that is presented in synthesis in table 2.

| Altitude gradient | Vegetation zone or floor | Territorial area | Type of Romanian cuisine | Gastronomic zones on altitude gradient |
|-------------------|--------------------------|-----------------|--------------------------|----------------------------------------|
| **Alimentation at low altitude (0-300 m)** | Stipa zone | Dobrogea, the west of Romanian Plain, the south-west of Moldavia | - Dobrogean cuisine - South-Moldavian cuisine | CULINARY PREPARATIONS FROM WET PLAIN ZONES: from the Danube, Danube Delta and Black Sea |
| | Forest stepa zone | Dobrogea Plateaus, the Romanian Plain, Oltenia, south of Moldavia, Jijia and Bahlui, Banat and parts of the center of Transylvania | - Dobrogean cuisine - Muntenia cuisine - Bessarabia cuisine - Banat cuisine | CULINARY PREPARATIONS FROM THE forest stepa PLAIN ZONE from: Bărăgan and Oltenia, Banat, Moldavia and Bessarabia |
| **Alimentation at little altitude (300-500 m)** | Oak tree family floor from plain and low hill zone | The Romanian Plain, Oltenia and south of Moldavia, centre and east of Moldavia and Transylvania (Ardeal, Crişana, Sătmăres and Maramureş) | - Muntenia cuisine - Moldavian cuisine - Transylvanian cuisine | CULINARY PREPARATIONS FROM THE high PLAIN and PLATEAU ZONE: Moldavia, Muntenia and Transylvania |
| **Alimentation at average altitude (500-1600 m)** | Under mountain oak tree family floor and the floor of beech forest and mixed forests (hardwood and softwood) 500-1300 m | Southern Carpathians, Western Mountains | - Ardeal cuisine - Muntenia cuisine | CULINARY PREPARATIONS FROM THE HILLY ZONE from: Valahia, Gorj, Vâlcea, Argeş, Dâmboviţa, Prahova, Buzău Hills |
| | Spruce fir trees floor 1300-1600 m (forests of spruce fir and fir trees) | The Southern Carpathians at the west of Olt, the Southern Carpathians at the west of Olt, the Banat Mountains, the Apuseni Mountains, the Eastern Carpathians | - Transylvanian mountain cuisine - Moldavian mountain cuisine - Muntenia mountain cuisine - Banat mountain cuisine - individual alimentation of natives and/or specific to mountain venturesome | CULINARY PREPARATIONS SPECIFIC TO THE MOUNTAIN AND INTRA-CARPATHIAN PLATEAU ZONE from: Ardeal |
| **Alimentation at high altitude (1600-2500 m)** | Under Alpine and Alpine floor | The highest picks from the Eastern and Southern Carpathians | -individual alimentation of natives and/or specific to mountain venturesome | CULINARY PREPARATIONS SPECIFIC TO HIGH AND ALPINE MOUNTAIN ZONE, from the whole arch of the Carpathian Mountains at altitude of 1800 m and especially over 2000 m. |
From gastronomic repartition on zones of altitude gradients it results that culinary preparations present difference and originality elements in the 4 analyzed zones (low, little, medium and high). The gastronomic profile and alimentation typology (structure of menu, specific receipts, traditionalism etc.) are directly linked to using raw agri-food materials. Thus, all these aspects may serve as reference comparative data in order to establish certain subsidies, prices, taxes, compensations, credit interests, rates, and salaries etc., differentiated on altitude in order to achieve agri-food products.

It is appreciated that the level of achievement of animal productions in the studied farms, at over 1.400 m altitude, barely attains half the production per animal, comparatively to the hill and plain zones and with almost double expenses per product unit. In view of diminishing the unfavorable impact of pedoclimate conditions of accessibility, sub development, infrastructure, upon productive performances in this zone, it is strongly necessary to elaborate a mountain legislation of socio-economic protection of the natives and the environment (Rey, 2007; Rey and Gruia, 2013).

In west-European countries, for several decades, there have been provided: subsidies differentiate prices and other major facilities for agricultural & animal breeding products, in function of altitude. For example, in Switzerland, for every 250 m altitude, in the mountain zone, over 30 years ago, the confederation used to offer 10% compensation for cow milk price, consequently to very strict studies made on altitude. Under this context, if in Romania we consider the prices of the products achieved at 0-600 m altitude as a basis, subsidy should increase with 10% for every 100 m altitude. In this case, a cow milk producer, from a farm situated at 1.500 m altitude in the Apuseni Mountains, who obtains 2.500 l/head/year, may achieve the same efficiency from this activity as a cow breeder from the Crisuri Plain, who produces 5.000 l milk/head/year under much more favorable natural conditions, similar to the example of the Swiss farmers.

From what has been mentioned, there may be observed the fact that Romanian cuisine in its whole is composed of distinct elements that sustain its originality, but which integrate in this Romanian whole, including distinct elements linked to altitude zone gradient, that confers Romanian cuisine a special gastronomic profile (table 3).

### Table 3. Gastronomic profile of the Romanian cuisine, in function of relief altitude

| ALTITUDE GRADIENT | SYNTHESIS CHARACTERISTICS |
|-------------------|---------------------------|
| Alimentation at low altitude (0-300 m) | - Fishermen world (Lipovensi and Hahols, the last ones being also peasants) imposes a unique gastronomy, at the same time primitive and complicated.  
- It is obvious that almost only fish is eaten, more rarely cheese and eggs, but sometimes bald coot and boar. There are though in great number all kinds of vegetables (acid, sweet) with a special taste, and the culinary surprise is represented by grapevine, with millenary wines (maybe even antique): Somoveanca and Negru de Sarichioi  
- Gastronomically, we notice a universe of sophisticated hotchpots and sour liquids, of „mititei” (Romanian sausages) and meatballs, of moussakas, of cottage cheese – with green onion, tomatoes and hot bread. A vegetable region, absolute champion of verdure boilings, of leek as a symbol, of culture and/or gathered vegetables. Sometimes there may be met unusual source methods (sour grapes, „tagrina”, gooseberries, green cherry plums), which accompany borsch made of any kind of meat and vegetables, as well as simple and rapid meals with vegetables and verdures (especially dill and lovage). |
| Alimentation at little altitude (300-500 m) | - The plain, but also certain plateau zones, offer a diversified, juicy and spicy, sensual and full of freshness cuisine (it covers a necessary of 3000-4000 calories/day)  
- Romanian gastronomy of average altitude is the most complex by combinations and mountain influences with the plain ones.  
- Traditional meals from mountain and plateau Ardeal, of the exterior of the Carpathians towards Moldavia, Muntenia and Banat are, some of them simpler, others more complex, but of high refinement, unitary in the whole Carpathian chain. There appear also local differences, specific to the analyzed mountain zone, which leads at least 7 gastro touristic runs: 1- gastro touristic runs in the North Eastern Carpathians; 2-gastro touristic runs in the Centre Eastern Carpathians; 3-gastro touristic runs in the South Eastern Carpathians; 4- gastro touristic runs in the Axes of the Carpathian Curve; 5- gastro touristic runs in the Center Southern Carpathians; 6- gastro touristic runs in the Western Southern Carpathians; 7- gastro touristic runs in the Western Carpathians |
| Alimentation at average altitude (500-1600 m) | - Traditional meals from mountain and plateau Ardeal, of the exterior of the Carpathians towards Moldavia, Muntenia and Banat are, some of them simpler, others more complex, but of high refinement, unitary in the whole Carpathian chain. There appear also local differences, specific to the analyzed mountain zone, which leads at least 7 gastro touristic runs: 1- gastro touristic runs in the North Eastern Carpathians; 2-gastro touristic runs in the Centre Eastern Carpathians; 3-gastro touristic runs in the South Eastern Carpathians; 4- gastro touristic runs in the Axes of the Carpathian Curve; 5- gastro touristic runs in the Center Southern Carpathians; 6- gastro touristic runs in the Western Southern Carpathians; 7- gastro touristic runs in the Western Carpathians |
| Alimentation at high altitude (1600-2500 m) | - Well chosen food on qualitative energetic and nutritional principles, because intense and prolonged muscle effort needs a high consumption of fats, sweets, nutritive substances and minerals, for all types of activities in the mountains and especially for those who climb at altitudes over 2000 m (it covers a necessary of 4000-6000 calories/day), when there are preferred semi liquid and liquid aliment. An orientative example in this direction:  
**In the morning:** sweetened milk with oat or corn flakes, coffee or nesca, tea, “lacovo”, honey, butter biscuits,

ginger bread.

In the run: dry fruit (grapes, prunes, plums) hazelnut, peanuts, almonds, milk and hazelnut chocolate, biscuits, nougat, conserved fruit.

In the evening: borsch or soup, potato flakes, flour pasta, rice, smoked meat, smoked or dry fish, „fosfarin”, charlotte, milk, „lacovo”, fruit juice, vitamins C, B1, B2 and B6. Altogether 1, 5-2 kg aliments per day.

Aliments to be as appetizing as possible and liquid if possible or accompanied by liquids. The list may be completed by: Sibiu salami, liver pâté, gammon, lemon, oranges, tomato juice, and tomatoes.

It must be mentioned that the model becomes more complicated in the situation when, besides the producing zone and the large food categories, it is taken into consideration the group of micronutrients, which represents in fact the research continuation. We practically speak about the tendency of present food evolution towards diets poor in nutrients, i.e. the more and more pronounced lack of nutritive food and the necessary to complete with nutritive supplements, i.e. the actual model with tendencies of systemic disintegration. In order to avoid the paradox situation, when people will eat sufficiently quantitative, but will be hungry because of using over processed food instead of the integral natural ones, or nutritively „diluted”, food (especially in micronutrients), the idea of integronic food draws conceptual basis for the harmonization of the relation quantity-quality, quality-price, quality-health, quality-environment protection (Gruia, R., 2014). The concept underlines the ever more accentuated utilization of natural integral aliments in relation with the processed ones and may apply new technologies that may lead towards the harmonization of the relation of food production, both in the impact with nutritive equilibrium and satiety, and in the impact with the environment, by avoiding pollution (the known example being linked to the high level of CO₂ that may increase crops with about 10 %, but reduce nutritive elements with 5-10 %).

4. Conclusions and recommendations

The tendency of modern alimentation evolution towards diets poor in nutrients, i.e. the more and more accentuated lack of nutritive food and the necessity to complete with nutritive supplements, leads to the actual model with tendencies of systemic disintegration. In order to avoid the paradox situation when people will eat quantitatively sufficient, but will be hungry because of using over processed food instead of the natural integral ones, or nutritively „diluted”, food (especially in micronutrients), the idea of emergent integration lays the conceptual bases for the alimentary act harmonization and equilibration. The proposed model is on the bases of the unitary and coherent concept of integronic alimentation, on directions of integration at individual level, by the organism food matrix based on the alimentary profile and on the gastronomic profile, and, at super individual level, by the environment-food-organism integronic matrix.

Apart from metabolic aspects at organism level and the nutritive factors, the alimentary act is conditioned by environment factors and the complex of intercultural variables, so that the food, the organism and the environment impose the idea to define the feeding act in a holistic manner. The idea of multiple systemic integration, on model of integronic matrix, leads to nutritive equilibrium for the maintenance of the life of the animal world organisms, through the processes of the fundamental metabolism. The matrix process of emergent integration is achieved by organism processing environment-food information, through two main ways: the nervous system and cell metabolism, through which is in fact processed the information of the food matrix by the principles of nutrigenomics, achieving both the integrality of the whole system, and its adaptation to the environment changes.

In the alimentary act the nutritive equilibrium especially changes because of some aspects linked to time (as biorhythm for example) and to space (as altitude for example). Individual biorhythms show us which are the hours when internal organs function at their maximal capacity, and through the integronic and chrono-geno-nutrition principles these ones may harmonize with aliment biorhythms. The less processed the aliments are, the more accentuated is the process, i.e. there is preserved equilibrated complexity specific to the biodiversity of natural integral aliments ("alive") with high nutritional quality, characterized by a nutritional profile with valuable specific indexes. The gastronomic profile presupposes the structural analyses of the menu, specific receipts, traditionalism, health generating food etc., which in fact means to find modalities to cover the physiologic necessary for a certain category of consumers, so that integration elements may be accentuated, both at the metabolism level and at the level of alimentary biodiversity and adaptation at the environment, including taking into consideration the geographic conditions.
Among geomorphologic factors, the relief altitude is linked to the type of flora, fauna and cultivated agricultural species or farm animal species, aspects that differentiate alimentation typology in function of altitude. In Romania there may be distinguished 4 gastronomic groups on altitude gradients: alimentation at low altitude (0-300 m), alimentation at little altitude (300-500 m), alimentation at average altitude (500-1600 m) and alimentation at high altitude (1600-2500 m).

The process of integration of the alimentary act on the territory of Romania is concomitantly going on both on the vertical, and on altitude zones, and on the horizontal, i.e. on historic and territorially-administrative zones. From gastronomic zones on altitude gradients it results that culinary preparations present elements of differentiation and originality in the 4 analyzed zones (low, little, average and high) because the gastronomic profile and alimentation typology are directly linked to the production of agrifood raw materials, also with specific in function of the altitude and traditionalism, which confers Romanian cuisine a special gastronomic profile, with unitary elements in harmony with originality local products.

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