

The agri-food system in Bolivia
and its impact on food and nutrition
(Situation Analysis 2005-2015)

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GLOSSARY

ADIM - Association of Industrial Millers
AFP - Pension Fund Administrator
CSUTCB - Single Trade Union Confederation of Peasant Workers of Bolivia
CONAMAQ - National Council of Markas of Qollasuyu
CIDOB - Indigenous Central of the Bolivian East
CNC - National Chamber of Commerce
CNA - National Agricultural Census
CPE – Political Constitution of Satate (PCS)
CTB - Belgian Technical Cooperation
EASBA - San Buenaventura Sugar Company
EBA - Bolivian Almond Company
EPAF - Strategic Production Company of compost and Fertilizers
EMAPA - Food Production Support Company
ENDSA - National Survey of Demography and Health
ESNUT - Global Survey of School Health
FES - Social Economic Function (SEF)
FAO - Food Agricultural Organization
INIAF - National Institute of Agricultural and Forestry Research
IICCA - Peasant Research and Training Institute (Tarija)
IPC - Consumer Price Index (CPI)
IPA - Agricultural Price Index (API)
IPIA - International Agricultural Price Index (IAPI)
HDI - Human Development Index
INE- National Institute of Statistics
Lacteosbol - Dairy Company Bolivia
MDRyT - Ministry of Rural Development and Lands
MSD - Ministry of Health and Sports
NPE - New Economic Policy
OAP - Agro-Environmental Productive Observatory (of the MDRyT)
OECAS - Peasant Economic Organizations
OECOM - Community Economic Organizations
PAHO - Pan American Health Organization
PAC - Structural Adjustment Program (SAP)
PROMIEL - Project for the Promotion of Honey
SPAN - Pro Analytical Services
SERNAP - National Service of Protected Areas
TCO - Community Lands of Origin
UPA - Agricultural Production Units
WHO - World Health Organization

EXECUTIVE SUMMARY

THE AGRO-FOOD SYSTEM IN BOLIVIA 2005-2015 AND ITS IMPACT IN FOOD AND NUTRITION

The study on the Agro Food System in Bolivia is part of a series of studies and research carried out by the author, which addresses fundamental aspects of the agri-food question.

In this moment of deep socio-political and economic transformations, the topic of analysis chosen on the evolution of the agro-food system in Bolivia in the last 10 years is very timely, not only because it allows to describe and analyze the relationship between the theoretical approaches of the policies and their real implementation, but also the repercussions they have on the productive aspects, on foreign trade, on the family budget, on the environment, and especially on the food and nutrition of the population.

The research considers the evolution of the productive structure in terms of agricultural food production, yields, labor productivity by region, seeds and inputs. Emphasis is also placed on the role of public food enterprises created by the State.

The role of foreign trade (exports and imports) is also analyzed in terms of its impact on domestic food production as well as the diversity of food from foreign sources, which leads to an analysis of the availability of food and nutrients per person, and its consequences on human health.

The study is based on extensive bibliographical compilation and official statistics, accompanied by case studies that best exemplify the nutritional food situation.

RÉSUMÉ EXECUTIF

LE SYSTÈME AGRO-ALIMENTAIRE EN BOLIVIE 2005-2015 ET SON IMPACT EN ALIMENTATION ET NUTRITION

L'étude sur le système agroalimentaire en Bolivie fait partie d'une série d'études et de recherches menées par l'auteur qui traite des aspects fondamentaux de la question agroalimentaire.

Dans ces moments de profondes transformations socio-politiques et économiques, le sujet de l'analyse choisie sur l'évolution du système agroalimentaire en Bolivie au cours des 10 dernières années est très opportun, non seulement parce qu'il permet de décrire et d'analyser la relation entre les approches théoriques des politiques et leurs la mise en œuvre réelle, mais aussi les répercussions qu'ils ont sur les aspects productifs, sur le commerce extérieur, sur le budget familial, sur l'environnement et surtout sur la nourriture et la nutrition de la population.

La recherche examine l'évolution de la structure productive en termes de production agroalimentaire, les rendements productifs, la productivité du travail par région, les semences et les intrants. L'accent est également mis sur le rôle des entreprises alimentaires récemment créées par l'État.

Le rôle du commerce extérieur (exportations et importations) est également analysé en fonction de son impact sur la production alimentaire domestique ainsi que sur la diversité des denrées alimentaires provenant de sources étrangères, ce qui conduit à une analyse de la disponibilité des aliments et des nutriments par personne , et ses conséquences sur la santé humaine.

L'étude est basée sur une compilation bibliographique étendue et des statistiques officielles, accompagnée d'études de cas qui illustrent mieux la situation alimentaire nutritionnel.

RESUMEN EJECUTIVO

EL SISTEMA AGROALIMENTARIO EN BOLIVIA 2005-2015 Y SU IMPACTO EN LA ALIMENTACIÓN Y NUTRICIÓN

El estudio sobre el Sistema Agroalimentario en Bolivia forma parte de una serie de estudios e investigaciones que realiza el autor, en el que se abordan aspectos fundamentales de la cuestión agroalimentaria.

En este momento de profundas transformaciones sociopolíticas y económicas, el tema de análisis escogido sobre la evolución del sistema agroalimentario en Bolivia en los 10 últimos años resulta muy oportuno, no sólo porque permite describir y analizar la relación entre los planteamientos teóricos de las políticas y su real implementación, sino también las repercusiones que tienen en los aspectos productivos, en el comercio exterior, en el presupuesto familiar, en el medio ambiente, y sobre todo en la alimentación y nutrición de la población.

En la investigación se considera la evolución de la estructura productiva en términos de la producción agrícola de alimentos, los rendimientos productivos, la productividad laboral por regiones, las semillas y los insumos. Se hace énfasis también en el rol que están desempeñando las recientes empresas públicas de alimentos creadas por el Estado.

También es analizado el rol del comercio exterior (exportaciones e importaciones) en términos de su impacto en la producción interna de alimentos como también en la diversidad de alimentos de procedencia extranjera, lo que induce al análisis de la disponibilidad de alimentos y de nutrientes por persona, y sus consecuencias en la salud humana.

El estudio se basa en una amplia recopilación bibliográfica y en estadísticas oficiales, acompañado por estudios de caso que ejemplifican mejor la situación alimentaria nutricional.

THE AGRO-FOOD SYSTEM IN BOLIVIA 2005-2015 AND ITS IMPACT IN FOOD AND NUTRITION

INTRODUCTION

The neoliberal economic policies implemented in Bolivia until 2005 meant a failure in the socioeconomic development of the country which led to a abrupt change in economic policy for the new government, which proposed the recovery of productive resources, the nationalization of companies, redistribution of income, support in health and education, and the promotion of production, thus favoring internal growth, among several others.

That is, initially the policies applied by the new government were of liberating inspiration, food sovereignty, implemented under the tutelage of the State as the main social protagonist, politically and economically through a series of legal provisions and instruments that favored the production family farming, the creation of state-owned food companies to supply the market, the priority to the domestic market rather than the export markets, the subsidies, programs / funds to support domestic production, price control and other direct State interventions in the market, never before happened in the country.

In that first moment¹, a series of laws² and regulations were promulgated that clearly favor the sector of the indigenous and peasant peoples, such as, for example, a greater registration and titling of land in the west of the country and the titling of TCOs.

In a second moment conceivable from 2011 to the present, a second set of social forces emerge - the agro-businessmen of the east, the importing companies of inputs, the peasant capitalist producers of the east called intercultural and even the transnational companies - that interact with the State significantly influencing agrifood policies, influence that translates for example in the extension of the term of the Social Economic Function (SEF); the expansion of the agricultural frontier (from 5.2 million hectares in 2014 to 13 million hectares in 2025); expansion of the transgenic crops prohibited by the State Political Constitution (the permissibility in the production of transgenic corn); consolidation and titling of the best productive lands in favor of medium-sized properties and great agribusiness in the East of the Country³; promotion of the use of agrochemicals with the consequent increase in imports; expansion of deforestation; use of resources of the Administrators of Pension Funds (SPF) as credits to agribusiness, among others.

This new policy that contradicts the initial postulates of the government policies of Food Sovereignty, of Living Well (Vivir Bien), the Care of Mother Earth, the support for ecological production and other approaches contained in the various Laws and even in the New Political Constitution of the State (2009), was also supported by other governments -in different

¹ Until 2011 that begins the fracturing of the process with the TIPNIS, and the withdrawal of political support from various social organizations (such as CIDOB, CONAMAQ and other Indigenous Peoples) to the government.

² For example, the "Law of community renewal or new law of agrarian reform", the "Law of mother earth (which establishes non-polluting production processesrespect for the capacity for regeneration of the land ... conservation to the life systems of land ... prevent risk conditions, among several others); "Law 144 of the agricultural productive community revolution"; the "OECAS-OECOM Law for the integration of sustainable family farming and food sovereignty"; the "Law for the promotion and support of the irrigation sector for agricultural and forestry production", among others.

³ Colque et.al. 2016

degrees- as in Ecuador, Nicaragua and in smaller extent in Argentina and Brazil, that in the course of those years fed that dogma.

At present, although there is an intervention of the State in the market as a regulator of certain aspects, in other aspects, absolute freedom is allowed in the market, so that other actors -even the monopolies- can be handled without problem, introducing agrochemicals, transgenic, renting/acquiring large areas of land that stabilize and still encourage large estates (latifundios), exploiting irrationally natural resources and encouraging and expanding monoculture.

This scheme that is being imposed in the country in recent years, is dominating agricultural policies and displacing basic crops, thus abandoning productive diversification, production and healthy food, traditional food habits (rich in nutrients); that is, abandoning the postulate of food security with sovereignty, to absorb models of global consumption managed by the market, with the consequent result of the decline of our productive structure, loss of diversity, increase in food dependency, poor nutrition and a increase in obesity and overweight.

This drastic reconfiguration of the economic policies of the State is presented internally⁴as the way forward in the future, in the coming years according to the "Sector Plan. Agricultural Development 2014-2018. Towards 2025 " (MDRyT).

The present analysis focuses on the evolution and development of the agri-food system in Bolivia, emphasizing the development of agricultural production, the food manufacturing industry, the role of state food companies, agri-food imports and exports, the availability of food, consumption and the nutrition.

It is highlighted in the analysis that - in the period studied - Bolivia has been successful in the fight against poverty and malnutrition since that index has been reduced even below the goals set in the Millennium Development Goals. The disparity between social sectors and regions / departments is also analyzed, with the risk not only to endure but of increase the situation.

In economics, there are a series of determinants to be considered as the strong relationship between labor consumption and productivity that suggests that a greater consumption or investment in human capital (in food, health, education) increases the productivity, or that greater malnutrition severe and chronic affects the low ability to study or work.

At the present, the country does not fulfill the above: it is true that there is greater investment than in previous years in health, education, social infrastructure (sports fields, social headquarters) and in the income of the population, however the productivity index continues to be very low, especially in the highland regions and valleys where the greatest poverty is concentrated.

The second determinant is the role played by agriculture in economic, social and ecological development at the national level. It is posed which is the sector that supplies the population with basic food, generates jobs, generates raw materials for the industry, and is the sector that conserves the environment and can better implement actions to face climate change, among others. However, the role that is now playing a part of the agricultural sector is to produce commodities, is that of commercial agriculture, exerting an activity of extraction of productive

⁴ Although the external discourse, the discourse at the international level is anti-market, anti-capitalist system, food sovereignty, care of mother earth, socialism of the 21st century.

resources that uses chemical substances (agrotoxics) that systematically poison the land and the environment, waters and forests, and that it has no sustainability.

The study tries to analyze the wide spectrum that include the Bolivian agro-food system addressed not only by official data but also by the extensive bibliography available to the author and the series of works carried out by him. The evolution is analyzed - in a summarized way - of the diverse subjects that the agro-alimentary system includes in the last 10 years of which statistical information is available, in relation to the postulates and the facts, to contribute to understand the contemporary agro-alimentary situation that crosses the country.

I. AGRICULTURAL PRODUCTION

The production and surface. In the period 2005-2015 the national agricultural production showed an increase of 42% (it went from 12,141,881 tons to 17,240,340 tons), however, depending on the years, there were strong increases (between 2005/2006 and 2008/2009 above all) as well as stagnation (2009/2010-2011/2012) as shown in Table No. 1 of the Annex.

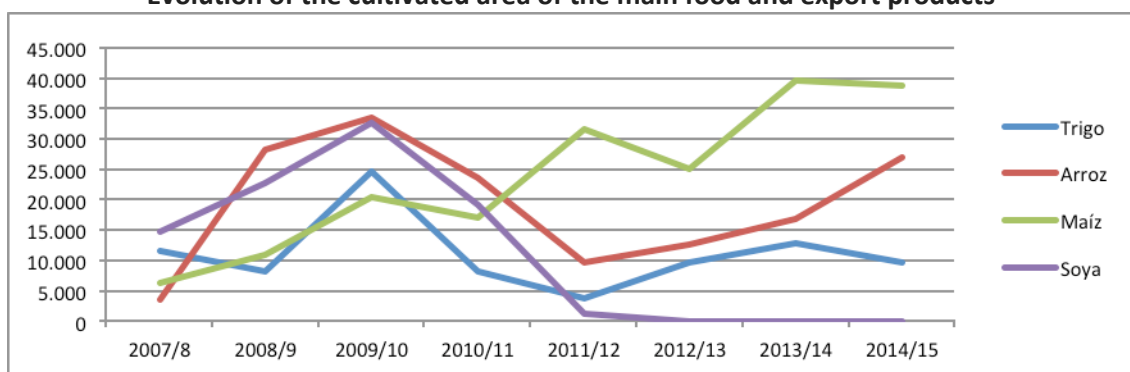
The products that present an upward trend are soy (especially between 2005/06 and 2013/14); the sunflower until 2013/14; quinoa in cereals; sorghum grain and in recent years, wheat (2014/15).

The products that show a decreasing tendency are some cereals (rice, barley), coffee, bananas, some vegetables (garlic in recent years); Sesame in industrial products and cassava in tubers and roots.

In short, production increased -especially export products- but not because of an increase in productive yields but because of the expansion of the cultivated area. Thus, between the years 2005/6 and 2014/5 there was an increase in the cultivated area of all agricultural products (see Table No. 2 of the Annex), since it went from 2.6 million hectares grown to 3.7 million hectares. (that is, it increased by 42%, as did the increase in production).

The main products that increased their cultivated area were the export products (soybean, sunflower, sugarcane) that increased almost double while the cultivated area of several staple foods decreased (rice, tomato, cassava, barley grain). In other groups the cultivated surface (bean) has hardly increased and several remain stagnant (garlic, beans, corn).

Graphic No. 1
Evolution of the cultivated area of the main food and export products



The productive yields. Regarding the productive performances, it stands out that all products show a general downward trend. At the beginning of the study period, products such as corn, cocoa and soybeans show increases but then decline. The products that have a permanent fall in their yields are potatoes, cassava, quinoa and various vegetables while products with variable yields (increases and decreases in productivity depending on the years) are rice, sorghum, coffee, fruit trees, cane sugar, mani, yucca and others.

These low production yields of the products⁵ are the lowest in Latin America. For example, while in Bolivia the average productive yield of the potato was 4,649 kg /He in 2014/5, in Peru 16,500 kg /He was achieved and in Ecuador 16,130 kg /He/average, that is, 3.5 times more⁶.

In the case of tomatoes, while in Bolivia they range 10,668 kgs / Ha, in Peru they achieve a yield 5.6 times higher (60,700 kgs / Ha). In the case of wheat, in Argentina it is produced between 2,500 -3,000 kg / ha while in Bolivia only 1,735 kg / ha was reached. In the case of corn, in Bolivia the average yield is 2,020 kgs / Ha while in Brazil they produce 3,600 kgs / Ha / average. The difference is also strong in export products since while in Bolivia the average yield of soybean is 2,020 kgs / Ha in 2014/15, in Brazil it was 3,600 Kg / Ha and in Argentina 2,448 kgs / Ha (www.CESO.org-Centro de Estudios Sociales. "Costs and profitability of soy in Argentina, 2015").

The seeds⁷. Another fundamental issue in the analysis of agricultural production is that related to seeds. The government with support from the World Bank invests in seed certification programs through the INIAF. By 2015, more than 119,000 tons of seeds were certified, with only 12.8% of this certification corresponding to the departments of the highlands and valleys (La Paz, Oruro, Potosí, Chuquisaca, where most of the peasant farmers who produce basic food are located) and 81% to the department of Santa Cruz⁸.

From the point of view of products, the use of certified seeds is minimal. In 2015, the use of certified seed of total potato production was only 3.71%, 2% of broad beans, 2.7% of peas and 6.6% of beans (INIAF 2016).

This also means that between 91% and 98% of the seeds of basic products (such as potatoes, beans, peas, quinoa) and 78% of the Vegetables come from peasant farmers who collect, select and then conserve them through their deposits and / or the creation of their own seed banks. This modality is deepened and complemented now by the farmers themselves, who have started the process of adapting the seeds to the new conditions generated by climate change.

⁵ 5. Reference is made to national average yields, however it must be clarified that with the system of natural production, the productive yields are much higher. For example, in Tarija, in 2011, 18.40 tons / Ha of onion were produced (2 times more than the national average and 1.3 times more than the yield in Santa Cruz where more agrochemicals are used) and 6 tons / Ha of peas (4 , 1 times more than nationally) (IICCA 2011).

⁶ In Peru, yields vary between 17,800 Kg / Ha (Apurimac) and 12,800 kgs / ha (Cusco) (Fte: La República 08/11/2014). In Ecuador they vary between 27,300 kgs / ha and 12,800 Kg / ha (Monteros G. 2016).

In Bolivia, production with natural inputs is achieving similar performances. According to the IICCA, in 2011, in several regions of Tarija they produce an average of more than 14,700 kg / ha of potatoes (2.8 times more than the national average of potato production that year) (Quoted in Prudencio J. 2011)

⁷ This as other sections is summarized from the chapter prepared by the author entitled "The food and national food security system", included in the study "Strategic review of food security in Bolivia" by Prudencio J, Alvarez C, Rocabado C; Morales JA, Villarroel S, and Zabaleta D (2017) Mpd/UCB, La Paz

⁸ In Santa Cruz, EMAPA demands in its support programs for wheat and rice producers, the use of certified seed (of the total of seeds certified in Santa Cruz, 41% corresponds to wheat and 10% to rice).

This process, which as altogether is essential to protect agrobiodiversity and the sustainability of agricultural development, food security and national food sovereignty, cannot be ignored by government institutions (INIAF) who should rather reinforce and strengthen these peasant initiatives rescue of crop varieties (which have resistance to diseases, pests, frosts, among others); promote the generation of new varieties and encourage the use of various seeds developed at the local and community level. This will reduce the country's dependence on seeds from abroad generated by transnational corporations (transgenic seeds) that, under the pretext that they generate an increase in productivity and have greater tolerance to pests, introduce them into the country.

The implementation of the above measures involves supporting and creating community seed centers or seed banks to ensure the availability of these adapted and developed locally, support and create local exchange networks⁹, ensure diversity and availability of goods; train in the stockpiling, selection and improvement of local seeds, and create or strengthen the certification of those healthy seeds to maintain the integrity of organic products (benefiting biodiversity and small-scale agriculture) and that these organic seeds are also a source of income for family farming¹⁰.

Labor productivity is another important issue in the analysis because it shows the enormous differences that exist between one region and another in the country (See Table 3 of the Annex). For example, in 2005, an agricultural worker in Santa Cruz (SCZ) produced 58 Tm/average, while in the altiplano and valleys region (La Paz, Oruro, Potosí, Chuquisaca and Cochabamba) he produced 1.7 Tm/average; say 33 times less. To 2011 this productivity increased in both cases (91 Tm/worker in SCZ and 2.4 Tm/worker in highlands/valleys) but then a permanent decrease was entered, as in 2015, a farmer in SCZ produces 76.33/Tm, while in the region of the altiplano and valleys a worker produces only 2.03 Tm/average, that is 37.6 times less.

This shows that as the years go by, the difference in labor productivity between regions is deepened.

This difference is also expressed in the amount of land cultivated per worker by region. For example, in 2005, the average worker in Santa Cruz cultivated 23 times more extension (11.25 hectares/worker) than the average worker in Potosí (0.48 Hs/Worker). This disproportionate relationship between a worker from the east and another from the altiplano continues because while in Santa Cruz a farmer grows 14.57 Hs/average in 2015, a farmer in La Paz grows 0.61 Hs/average, that is 24 times less than in Santa Cruz.

II. THE NATIONAL FOOD MANUFACTURING PRODUCTION

Another important aspect to mention in the subject related to the production, is the one referring to the food manufacturing industry¹¹, whose contribution to the national Gross Domestic Product (GDP) increased from 6.5% in the period 1999-2005 to 7% in the period

⁹ To exchange is to guarantee the circulation of the genetic material since the seeds constitute an important element in the cultural life of the communities and peoples.

¹⁰ Prudencio J. (2011)

¹¹ That includes the sectors of milling / bakery, sugar and confectionery, various products, beverages, fresh and processed meats, and dairy products. The analysis is limited only to certain years of the study period, due to lack of statistics and official information.

2006-2014. Similarly, the food industry increases its contribution to Industrial GDP from 47% (in the period 1999-2005) to 52% between 2006 -2014¹².

Although the food industry in general has grown between 2006 and 2012, it increased the Gross Value of its Production from 7.9 million Bs in 2001 to 18.7 million Bs in 2010, the Value Added from 2.3 million Bs in 2001 to 10.5 million Bs in 2013 (see table No. 4 in Annex) and the number of jobs¹³, is mainly due to the increase in production in the milling industry; drinks; sugar, and various food products.

Despite these increases, there are few sectors that increased their productivity between 2006 and 2013. Only "diverse products" and "beverages" increased by 43% and 82% respectively, while the other sectors decreased their productivity¹⁴.

On the other hand, two aspects also stand out: first, the high imports of inputs¹⁵ from the national food industry that are constantly increasing despite the great agricultural potential of the country. The second aspect to highlight is the redirection of these imports.

In 2012, the highest value of imported inputs corresponds to the beverage industry (34% of the total) followed by the diverse food products industry¹⁶ (25.6%), having been displaced from the first place in imports, raw materials of the milling industry (wheat / wheat flour¹⁷ that for many years or decades represented the highest value of imports of inputs from the national food industry.

If we add to these two industries (beverages and various food products) the imports of inputs for the sugar industry (9.6%), we have that these three industries represent two thirds (69.2%) of the total value of imports. This new reconfiguration of imports of raw materials in favor of sweetened food products, sugary drinks and others that the WHO / PAHO calls ultra-processed and that are largely responsible for obesity, overweight and diabetes, is due, among other factors, to the rapid urbanization process that the country is experiencing, the liberalization (and lack of control) of all types of food imports, the increase in the economic income of the population that demands these products, and the increase in of supermarkets and micromarkets that sell them, among other factors.

III. STATE COMPANIES IN FOOD PRODUCTION

There are several state food companies¹⁸ that have been forming or establishing in the country for some years, among which EMAPA is the most important and most significant in the national context.

¹² On the other hand, this increase also shows that the Bolivian industry in general is incipient in its development because the sectors that should have a greater participation in industrial GDP should be those made up of capital goods, technology (oil refining for example) and not the food industry that neither elaborates sophisticated products nor complex processing.

¹³ It represents 3% of the total of the National Productive Units and in turn generates 37% of the total employment of the national industry (www.MDPyP).

¹⁴ Milling and bakery decreased by (-) 31.2%; fresh and processed meats in (-) 13%; sugar and confectionery in (-) 6.5% and including the dairy industry in (-) 7%.

¹⁵ They increased 3 times in the total value (from 1,379,289 Bs in 2006 to 4,372,455 Bs in 2012). Imports of inputs for Sugars increased 7 times its value and doubled in the rest of the industries.

¹⁶ Which mainly comprise preparations for soups, stews or broths; homogenized composite food preparations, prepared baking powders, among others.

¹⁷ That now represent 21.4% of the total, while in the 80s and 90s they represented 55% of the total imported (Prudencio J. 2009 "Agriculture and poverty in Bolivia")

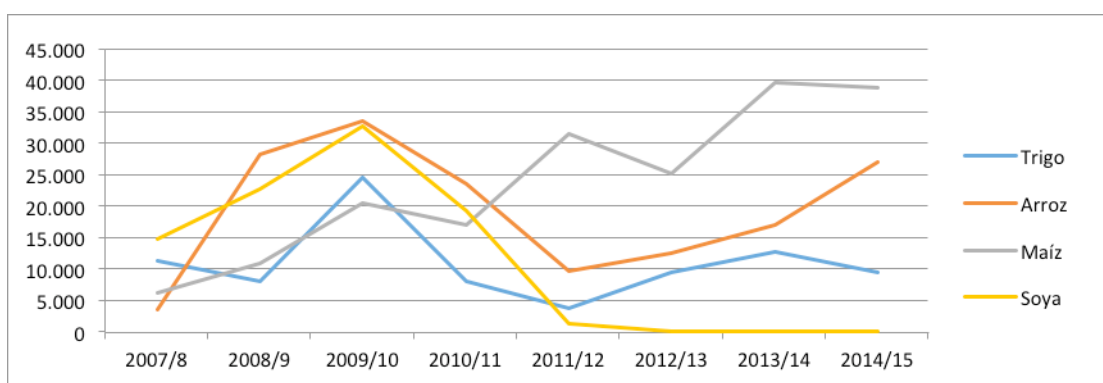
¹⁸ The productive food complexes are PROMIEL, EASBA, Lacteosbol, ProBolivia, Insumos Bolivia, EBA, EEPAF (inputs for production) and EMAPA

For this reason EMAPA is considered in the study as an adequate and representative case study.

EMAPA starts its activities in 2007/8 through the support to the production of certain basic products (wheat, corn, rice and initially soybean) with seeds, agrochemicals, diesel¹⁹; stockpiling and buying the production. It also ventures into the commercialization of these products and other basic foods of the population.

In the *production aspect*, EMAPA²⁰ supports two agricultural campaigns per year (summer and winter) and from 2007 until the winter season of the 2015 supported 523,324 hectares, corresponding 36% to corn, 30% to rice, 17% to wheat (and the rest, 17% to soybean). It also highlights that all the products had greater support in 2008/2009 (due to the global food crisis); that corn is the only product that shows an upward trend in support and that the amount of hectares supported by product vary considerably from year to year.

Graphic No. 2
Amount of hectares supported by EMAPA according to product (2007-2015)



Source.- Graphic constructed by the author based on data from EMAPA

The surface supported by EMAPA in aspect to the total area planted at the national level is not very significant since in the case of corn it ranged between 2.5% (2008/9) and 10% (2013); in wheat between 2.3% (2011) and 6.8% (2013); and in rice between 5.3% (2014) and 15.9% (2013).

Regarding the number of producers receiving support from EMAPA, in the eight years considered (2007/8 -2014/15) it reached 50,572, with the greatest support for wheat producers (45% of that total), followed by producers of corn and rice (22% each), and later to those of soybeans.

The number of agricultural producers supported annually by EMAPA in the national context is not very representative. In 2013, the National Agricultural Census (CNA) determined that there were 861,610 Agricultural Productive Units (APU) throughout the country and if we assume that EMAPA supported one producer per Productive Unit, we have in that year EMAPA supported a total of 2,364 producers, that is, 0.32% of the total producers in the country²¹.

¹⁹ They deliver to the producer as an advance form of payment. (Actually it is a 0% interest credit).

²⁰ The source of all the data referred to EMAPA comes from the database of the "Planning and Projects Unit" of EMAPA.

²¹ From the point of view of the departments where EMAPA supported that year (2013), the result is still lower. In Chuquisaca it supported 826 producers (1.14% of the total UPAs of Chuquisaca according to the 2013 CNA), in Cochabamba 700 (0.38% of the total UPAs), in Potosí 624 (0.50% of the total UPAs), in Santa Cruz 462 in the winter harvest (0.40% of total UPAs) and in Tarija 214 (0.52% of total UPAs).

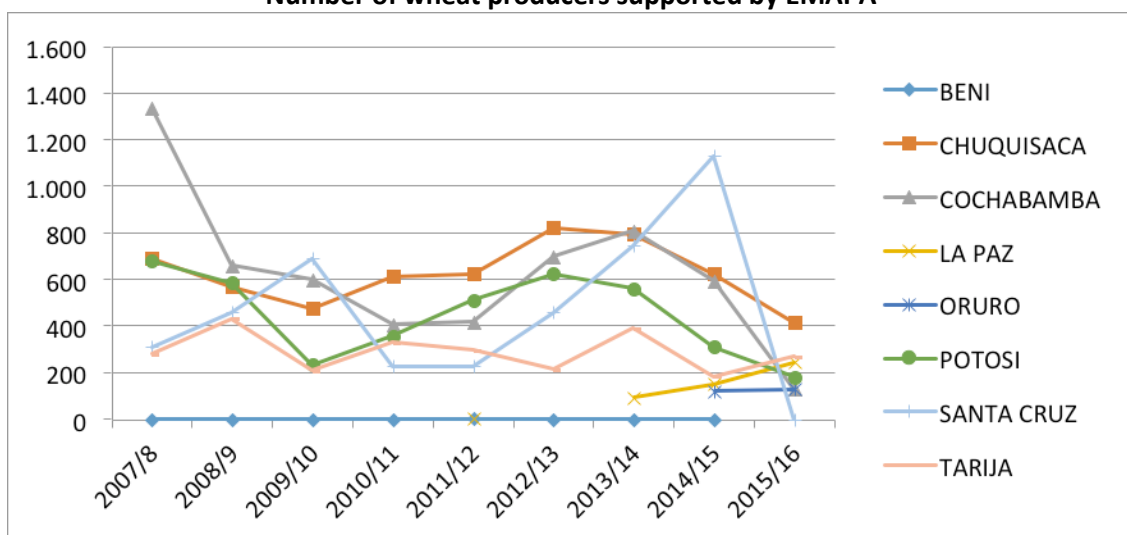
The case of wheat.

From the point of view of the analysis by product supported by EMAPA, the situation varies considerably from one to the other.

The case of wheat is very demonstrative not only because of its importance regarding the population's diet, the agrarian productive structure, commercial imports and industry, among others, but also because it is the main product supported by EMAPA.

The largest number of wheat producers (22,942) supported by EMAPA in the 8 years of life corresponds to Chuquisaca and Cochabamba (25% of the total in each case), then to Potosí (18%). In La Paz and Oruro, support was negligible: 0.021% and 0.01% respectively, despite the fact that most APUs in both departments cultivates this product for self-consumption, since it is a basic product in their diet.

Graphic No. 3
Number of wheat producers supported by EMAPA



Source.- Graphic constructed by the author based on data from EMAPA

The average number of hectares cultivated per producer receiving support from EMAPA also varies according to departments and years. In the period analyzed, two tendencies are presented; On the one hand, support for the microfund (in the case of Chuquisaca in 2007/8) has stopped and support for large wheat fields is also being abandoned (in the case of Santa Cruz in 2007/8). In the midst of these two trends, there is support for crops in the rest of the departments, with variable extensions.

Table No. 1
Hectares (average) of wheat grown by producer with support from EMAPA

Department	2007/8	2011/12	2014/2015
Chuquisaca	0.71	1.63	2.43
Cochabamba	2.10	1.77	3.13
Potosí	2.18	0.83	1.40
Santa Cruz	20.53	19.44	10.22

Source: Built by the author based on data from EMAPA

EMAPA does not provide data referring to the quantity of wheat produced with the support it provides nor the yields achieved in each department. It also does not provide information on production costs in each region, so it is difficult to calculate the impact achieved by the program.

EMAPA only presents the area supported, the prices paid to the beneficiary and the non-beneficiary, and the quantity of wheat collected (without differentiating the origin of that stock).

The prices. - In the prices paid, these vary if the beneficiary producer is located in Santa Cruz (winter harvest) or in the rest of the country (summer harvest). There is also a difference in the price paid to the beneficiary of EMAPA and to the non-beneficiary.

The prices paid to the beneficiary of the West are a little higher than those paid to the Santa Cruz producer, with variations from 1.8% (2012) to 18% (2016). The only year that was the same price in both places was 2015.

Regarding the price paid to the non-beneficiary producer of EMAPA, the only significant variation occurred in 2011 when the price paid to the beneficiary was 14% higher than the price paid to the non-beneficiary. In the rest of the years the difference is very small (between 2% and 3%), although in 2015 and 2016 there is no difference in both prices (so it would be the same whether or not to be a beneficiary of EMAPA).

Table No. 2
Prices paid by EMAPA and prices of imports

Years	Price paid in the west (summer)	Price paid in Santa Cruz (Winter)	Price paid to the non-beneficiary (SCZ-winter)	Prices of imports	
				Price of imported wheat \$us/Tm	Price of imported flour \$us/Tm
2008	160 Bs/qq	2.69 Bs/Kg	-	291,49 (2.00 Bs/Kg)	577,3(3.93 Bs/Kg)
2009	124.2 Bs/qq	2.26 Bs/Kg	.	s.d.	s.d.
2010	2.70 Bs/Kg	2.43 Bs/Kg	2.16 Bs/Kg	s.d.	s.d.
2011	3.26 Bs/Kg	3.13 Bs/Kg	2.75 Bs/Kg	289,76 (1.93Bs/Kg)	398,74 (2.69 Bs/kg)
2012	3.26 Bs/Kg	3.20 Bs/Kg	3.09 Bs/Kg	s.d.	s.d.
2013	3.58 Bs/Kg	3.48 Bs/Kg	3.41 Bs/Kg	334,72 (2.27 Bs/Kg)	486,62 (3.31 Bs/kg)
2014	3.80 Bs/Kg	3.44 Bs/Kg	3.41 Bs/Kg	332,44 (2.27 Bs/Kg)	488,74 (3.37 Bs/Kg)
2015	1.98 Bs/Kg	1.98 Bs/Kg	1.98 Bs/Kg	245,79 (1.65 Bs/Kg)	336,85 (2.27 Bs/Kg)
2016	2.60 Bs/Kg	2.19 Bs/Kg	2.19 Bs/Kg	s.d.	s.d.

Source: Built by the author based on data from de Management of EMAPA and the INE (foreign trade)

According to the executives of EMAPA, the stockpiling prices are determined based on the prices of the international wheat and wheat flour market.

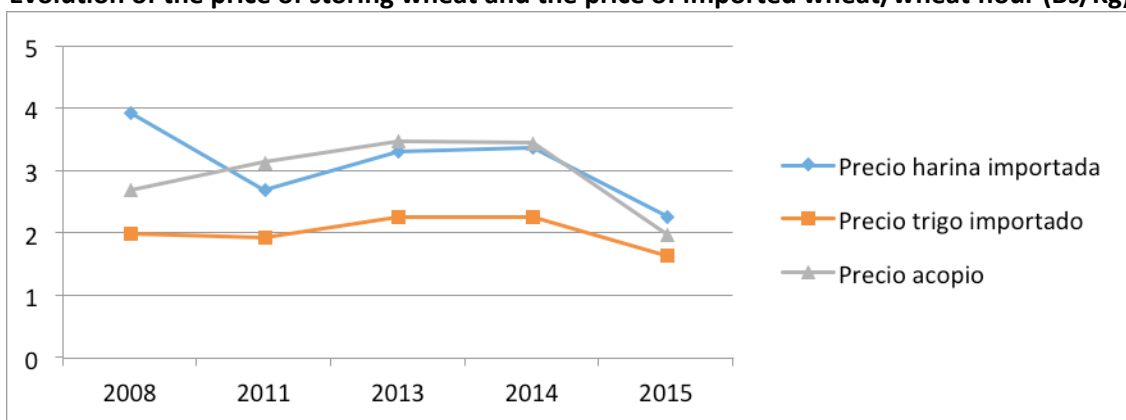
Initially, EMAPA accumulated the product, then delivered it to the bakeries in predetermined quantities - according to the capacity of the bakery - to prevent speculation and/or leakage of the product, according to the price that EMAPA determined.

At the same time, EMAPA imported wheat or wheat flour depending on the international price. In this way it is explained that some years there were large imports of wheat and not wheat flour, and other years the result was reverse.

Regarding the price of stockpiling, until 2008 this was lower than the price of imported flour but higher than the price of imported wheat. Subsequently, the stockpiling price is higher than the other two products until 2014, but in 2015 there is a decrease in international prices and it is the occasion for EMAPA to relocate the stockpiling price to lower levels²², since before the 2011 paid a price higher than the international price of wheat and wheat flour. This internally, produces a decrease in the number of producers beneficiaries of EMAPA (from 3,121 in 2014 to 2,517 in 2015).

Graphic No. 4

Evolution of the price of storing wheat and the price of imported wheat/wheat flour (Bs/Kg)



Source: - Graphic constructed by the author based on data from the Management of EMAPA and the INE

The stockpiling. Regarding the stockpiling of the wheat made by the company, it varies according to the years and the harvests. EMAPA collect in the summer campaigns from a minimum of 677 tons (2007/8) to a maximum of 48,892 (2011/12), and in winter from 26,532 tons (2011) to 102,759 tons (2009). On the other hand, the supported surfaces also vary according to the campaigns: the summer since 2.376 (2011/12) Hs up to 5,153 Hs. (2013/14) and in winter from the 1,346 Hs (2012) up to 21,585 Hs (2010), as shown in the following table.

Table No. 3

Surfaces supported by EMAPA and collected amount of wheat according to agricultural campaigns

Harvest	Supported surface (Has)	No. Of beneficiary associations	Amount collected (Tm)	Performance Área	Western área yield (traditional) (Tm/Ha)
				eastern (SCZ)	
				(Tm/Ha)	
Summer 2007/8	4.932,75	57	677,04		0.13
Winter 2008	6.510,25	16	41.478,41	6.37	
Summer 2008/9	2.544,00	57	2.263,52		0.88
Winter 2009	5.565,50	6	102.758,84	18.41	
Summer 2009/10	3.131,25	47	2.299,46		0.73
Winter 2010	21.586,40	11	36.141,66	1.67	

²² This decrease in the subsidy produced an increase in the price of wheat flour which in turn resulted in the rise in the price of the bread from 0.40 Bs / unit to 0.50 Bs / unit after having maintained that fixed price for 6 years.

Summer 2010/11	3.647,50	59	2.389,76		0.65
Winter 2011	4.415,00	7	26.532,00	6	
Summer 2011/12	2.376,50	59	48.891,75		20.57
Winter 2012	1.346,47	4	51.434,83	38.19	
Summer 2012/13	5.119,99	102	3.896,30		0.76
Winter 2013	4.496,17	10	44.328,26	9.85	
Summer 2013/14	5.153,46	127	3.176,47		0.61
Winter 2014	7.626,73	11	102.184,63	13.39	
Summer 2014/15	4.264,25	114	1.664,69		0.39
Winter 2015	5.323,94	10	79.021,15	14.84	

Source: Built by the author based on data from EMAPA Management

Analyzing the cultivated area and the quantity stockpiled, we will assume that the result is the productive yield²³.

In the traditional zones, EMAPA would have obtained very different productive yields: from 0.13 Tm/Ha (2007/8) to 20.57 Tm/Ha (2011/12). It also achieved very low yields because if we compare with the yields of the departments of the western part of the country, we have for example that in the 2010/11 harvest, the average productive yield of wheat was 0.77 Tm / Ha²⁴; in 2013/14 it was 0.845 Tm/Ha and in 2014/15 0.866 Tm/Ha²⁵, almost all of them higher than those achieved with the support of EMAPA.

Despite these yields (as a result of the EMAPA statistics), the company sustains that with its support it managed to increase the productive yields of wheat to 1.60 Tm/Ha average²⁶. However, the amount of wheat harvested is less than the quantity sold to EMAPA.

For example, if in the 2013/14 campaign 5,153 hectares were supported, the production would have been 8,244.8 tons. If that number is discounted the 3,176.47 tons collected by EMAPA, there is a significant balance of 5,068.33 tons. ¿What was the destination of those tons? ¿The family self-consumption, the exchange of products, the sale to intermediaries or were they sold directly at local fairs?²⁷

²³ Regrettably EMAPA does not provide specific information on the productive yields achieved by region and agricultural campaign.

²⁴ According to the official statistics of the MDRyT, that year in Chuquisaca (CHQ) 0.932 tons / Ha was achieved, in Cochabamba (CBB) 0.866 tons / Ha, in La Paz 0.582 tons / Ha, in Oruro 0.783 tons/Ha and in Potosí 0.707 tons/Ha.

²⁵ That year in CHQ was of 1.13 Tm / Ha, in CBB of 0.99 Tm/Ha, in La Paz of 0.73 Tm/ha, in Oruro of 0.55 Tm/Ha and in Potosí of 0.91 Tm / Ha. (MDRyT)

²⁶ EMAPA highlights that the productive returns achieved with its support are the following (Tm / Ha):

Product	Zona	1985-2005	2007-2016
Wheat	traditional zone	0.80	1.60
	eastern zone	1.08	2.00
Corn	Santa Cruz y Chaco	2.50	4.20
Rice (to dry)	eastern	2.50	3.48

²⁷ Regarding the performance shown by EMAPA in 2011/12, it does not have coherence, since it is almost 20 times more than what was achieved in the other years. The only possible explanation is that EMAPA stockpiled wheat not only from the producers of the western regions but also from the producers and merchants from the east, since the price at that time was 3.26 Bs/Kg while in Santa Cruz it was 3.13 Bs / Tm and 2.75 Bs /Tm to the non-beneficiary (in the previous campaign the price was 2.43 Bs/Kg to the beneficiary and 2.16Bs/Kg to the non-beneficiary). Surely they stored the wheat from the previous harvest and then sold it.

Regarding the productive yields obtained in the winter harvest in the eastern area, these are also diverse and disparate since according to the data of the previous table, they vary from 1.67 Tm / Ha (winter harvest 2010) to 38.19 Tm / Ha (2012). These yields are also different to the average productive yields achieved in Santa Cruz (which in 2012 reached 1.66 Tm / Ha, in 2013 to 1.31 Tm / Ha and in 2014 to 2.2 Tm / Ha according to the MDRyT) and even different from those declared by EMAPA.

If in the western part of the country, EMAPA supported the wheat producers who did not deliver all their production to the company; in the eastern zone the opposite happened. If we take as an example the situation of 2014, EMAPA supported 7,626.73 Has. which produced 17,190.6 tons. in the best case . That year, EMAPA collected 102,184.63 Mt, that is, it collected from its beneficiary producers only 16.8% of the total stock and the rest (83.2% or 84.994.03 Tm) was collected from other agents that were not its beneficiaries (remember that in that year, the price paid by EMAPA was higher than the international price of wheat and wheat flour. See figure No. 4). It is clear then that EMAPA collected a small part of wheat from its beneficiary producers and a very large part from other agents (... .contraband?), "at a fair price", a price that was more excessive than the international price.

According to the EMAPA executives themselves²⁸, the number of producers and regions supported by EMAPA varies from year to year since it is the producers themselves who decide which products to grow each year depending of the market, so that, the beneficiaries of the subsidized support are not the same ones every year.

The two situations - that of the western zone of the country and that of the eastern zone - lead to the conclusion that EMAPA does not subsidize the producer but subsidizes the one that markets the wheat. In this way it is explained that EMAPA has "collected 52% of the total national production in 2008/9; 69% in 2011/12 and only 22% in 2014/15. As a result of this effort, between 2009 and 2015 EMAPA commercialized between 100,000 qq and more than 2.5 million qq/flour/year, affecting the price stability of the flour "(EMAPA: Planning and Projects Unit)

The support in the commercialization of food products. Regarding the commercialization of food, EMAPA not only "stockpiled products in the regions where it works creating a strategic reserve that exceeded 1.9 million tons of corn, wheat, rice and soybeans between 2008 and 2016" (EMAPA Planning and Projects Unit) but also bought various types of food (beef and chicken, soy meat, oils, sugar) at various periods, regions and market situations (scarce, rising prices, occultation) and then sell them in various cities²⁹at prices more appropriate and prevent crescent prices.

All this process of commercialization and incidence in the markets is implemented with a significant subsidy of money.

The subsidies.- Both the process of stockpiling the grains and the marketing of food are implemented through a financial subsidy from the State, which has had a permanent increase since its inception (2009) until 2014, to then decrease in the following years.

²⁸ Interview with Mr. Fernando Silva Head of Planning and Projects of EMAPA

²⁹ To this end, it has established 46 points of sale in 11 major cities of the country, and recently supermarkets in the cities of Cochabamba and El Alto ("SuperEMAPA" where it has 934 products among vegetables, beverages, milk and dairy products, cereals, fruits and several other products more).

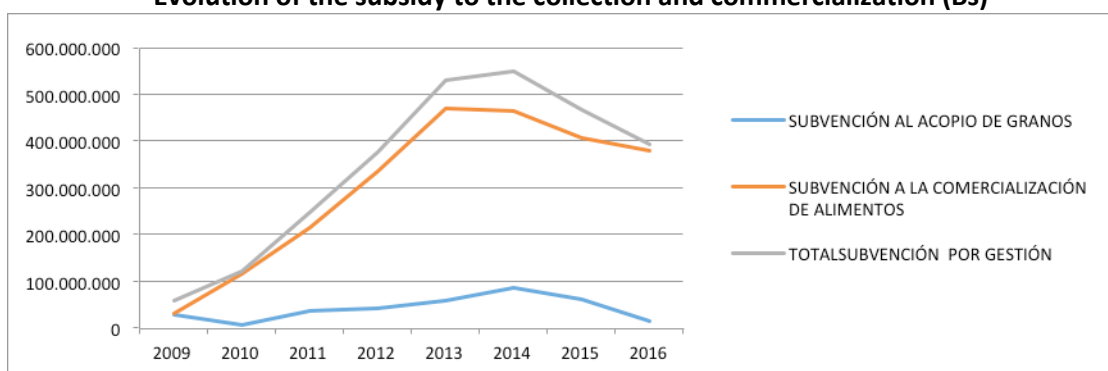
Also highlights that at the beginning, both subsidies (collection and marketing) had the same amounts of money, but then the marketing subsidy is greater than the subsidy to the collection, especially in the year 2010 (representing 18 times more) and 2016 (25.6 more times), which are years when the subsidy for grain storage falls sharply.

Table No. 4
Subsidies from EMAPA to stockpiling and marketing (2009-2016) (in Bs)

YEARS	Subsidy to grass	Agreement subsidy to food marketing	Total Grant by Management
2009	29.082.558	29.556.320	58.638.878
2010	6.332.969	115.231.314	121.564.283
2011	35.914.801	212.376.306	248.291.107
2012	42.552.313	333.726.810	376.279.123
2013	59.913.368	470.091.025	530.004.393
2014	87.451.705	463.128.858	550.580.563
2015	61.457.226	405.170.458	466.627.684
2016	14.719.366	377.717.716	392.437.082

Source. EMAPA

Graph 5
Evolution of the subsidy to the collection and commercialization (Bs)



Source.- Built by the author based on data from EMAP

EMAPA generates a series of income, but spends more than it generates. Between 2008 and 2015, it generated revenues by 4,2 times more, but spent 4.8 times more. The result is that EMAPA has a deficit since 2010, which is covered by a grant with a permanent growth trend.

Table No. 5
Expenses - Revenues and Subsidies to EMAPA (in millions of Bs)

	2008	2009	2010	2011	2012	2013	2014	2015
Total EMAPA income	339,795	919,837	672,168	461,489	574,226	405,711	1.185,326	1.429,818
Operating income EMAPA	143,621	288,767	298,701	309,357	309,876	405,711	884,916	1.084,066
Public sector transfer	196,173	631,070	373,467	152,132	264,351	0	300,410	345,752
EMAPA total expenses	308,802	915,997	698,000	527,129	817,533	1.073,529	1.202,649	1.504,291
Result EMAPA	30,993	3,840	-25,832	-65,639	-243,306	-667,817	-17,323	-74,472

Total amount of the EMAPA subsidy	230,545	203,165	423,199	257,545	583,446	771,695	766,523	711,943
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Source.- SIGMA, EMAPA 0572, (built by Cecilia Alvarez-UCB)

In summary, EMAPA supports the production and collection of products, and also affects the sale of raw materials to the manufacturing industry (baking industry, balanced foods) and directly commercialize food in his stores/markets, and in the "fairs of the price and right weight".

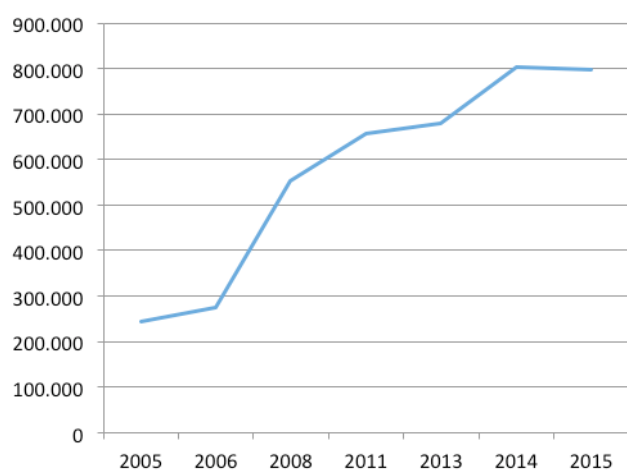
EMAPA is not only a state company that ventures into the market but has also become an operational instrument of the government to implement, intervention policies in the food market (temporary regulations such as the application of subsidies, prohibition of exports of certain products that were scarce for domestic supply, direct imports of other staple foods to supply the population, and direct food sales among others) and to avoid price increases (price regulating agent)³⁰.

IV. FOOD FOREIGN TRADE

4.1. Food Imports

Food imports between 2005 and 2015 have an increase in permanent value as they go from US \$ 242.3 million to US \$ 797 million, that is, they increased three times.

Gráfico 6.
Evolucion de las importaciones de alimentos
(miles \$us)



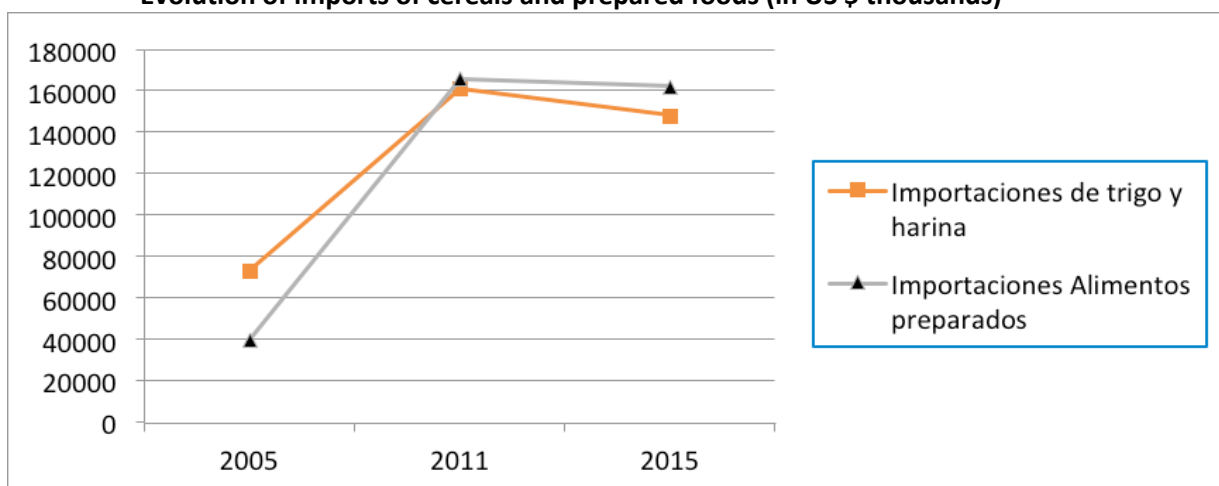
In 2005, the main imported products were cereals (wheat, wheat flour and cereal derivatives), which represented US \$ 128.7 million (53.14% of total imports). In second place were prepared foods that represented US \$ 39.9 million (16.49% of the total) (See table No. 5 of the annex).

In 2015, Prepared Foods represent the first group of imported foods (although that place since 2010) with almost 162 million (25% of total imports). On the other hand, this means that in the 10 years considered, they increased 4 times their value and 2 times their amount. In 2005, a TM of these foods cost US \$ 1,781.6 and in 2015 they cost US \$ 3,312.5 / MT, which means that their monetary value increased 1.8 times more per ton³¹.

³⁰ Due to occultation and speculation on the part of merchants, intermediaries and others.

³¹ It is necessary to know the nutritional content of these foods in order to calculate the value of the imported caloric intake and determine its importance from the nutritional point of view

Graphic No. 7
Evolution of imports of cereals and prepared foods (in US \$ thousands)



Source.- Prepared by the author based on INE data.

The growth of this type of imported food shows, on the one hand, the assimilation and generalization of a globalized diet and food consumption, alien to our eating habits and the reflection of a more than anything urban way of life³² that demands ready-to-eat foods. They are usually for sale in supermarkets, small restaurants and even grocery stores.

Another aspect that stands out is the increase in the import of products that the country produces (such as corn³³, potatoes, tomatoes, variety of fruits, meats, rice, milk and others), basic products in the diet of the population, affecting the country's dependence on imported products and in the non-achievement of national food sovereignty.

Potato imports call for reflection as the country (along with other Andean countries) is the origin of this product, which in turn is the main product consumed at rural level. Although in 2005 only 2,809 tons were imported, in 2008 there was an increase that arrives 23,354 tons, amount that is increasing continuously exceeding 31,000 tons (2014). In other words, between 2005 and 2014, potato imports increased 11 times more.

Vegetables and leafy vegetables are another important group in food imports. Although from 2005 to 2011 there is a decrease in the amount of these imports, as of 2013, a contrary situation begins, since imported 4,417 tons are passed to more than 8,000 tons in 2015. More serious is the situation of tomatoes (main product of the group of vegetables and leafy vegetables) that since 2005 presents a continuous increase in imports incoming in 2015 to import 5,842 tons, that is 16.5 times more than 10 years before.

They also highlight imports of *fruit/ canned foods and derivatives* (between 2005 and 2015, imports increased from US \$ 7.5 million to US \$ 30.4 million), not only because the country has the capacity to produce all kinds of fruits and derivatives, but also because they demonstrate be a consequence of deforestation, of replacing seedlings / plants / fruit trees with other

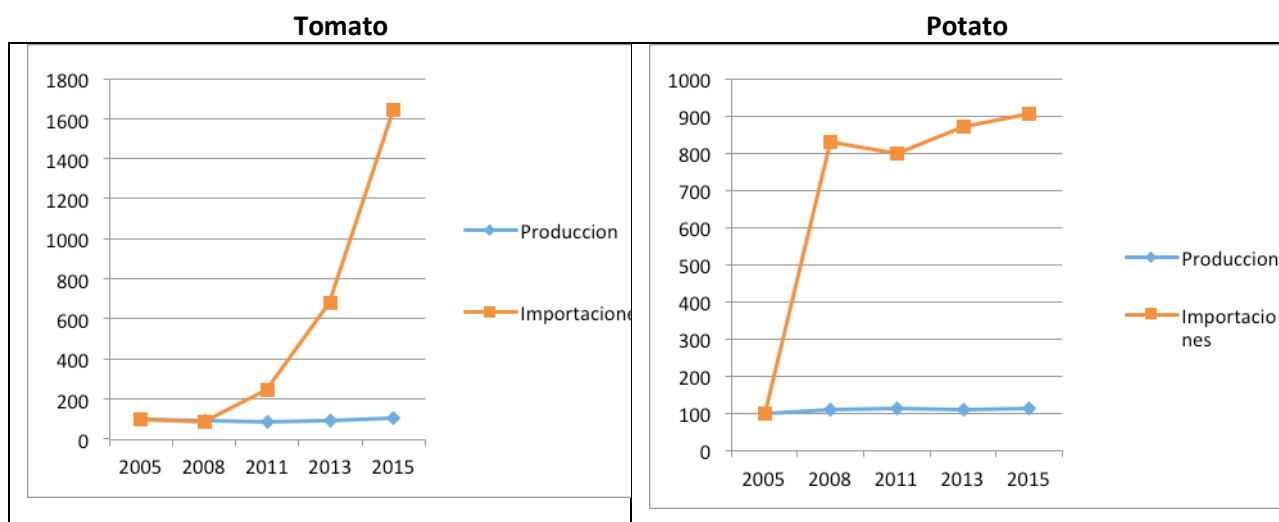
³² With the fever of constructions of houses and departments (homes of the workers and employees) that has been unleashed in the main cities of the country, increasingly away from the sources of work; more vehicles and roadways congested by excessive vehicle traffic, which generates shortage of time to return home to prepare lunch (starter, traditional soup, main plate, dessert and other preparations that were tradition in almost every household Bolivians), lunch and return to work.

³³ The country has the largest variety of maize races (77) identified in the world, which are without the support of specialized government institutions and endangered by transgenic maize (Crespo M.A. 2016)

crops; and at the same time, of the incipient that continues being the national manufacturing industry of fruits and derivatives.

These imports have a direct impact on domestic production, which is discouraged. The growth rate of imports of products produced in Bolivia, such as potatoes and tomatoes for example, is higher than the rate of growth of production (see graphic below), which in turn influences Product Availability per Person year decreases, as discussed below.

Graphic No. 8
Growth rate of domestic production and imports of potatoes and tomatoes (%)



Source. Built by the author based on data from Annex Table No. 8

Food smuggling.- Illegal food imports (smuggling) increase more and more not only in quantity and value, but also in variety and provenance (Chile, Argentina, Peru, Paraguay and Brazil) depending on the prices (for the type of change different in each country) and of the time, in a massive way and in small quantities (contrabando hormiga).

This problem dates back several years. Some studies of the Chamber of Exporters of Bolivia indicate that in 1995, contraband in general exceeded \$ 830 million; US \$ 1,200 million in 1997 and US \$ 686 million in 2006. (aforementioned in Prudencio J. 2009).

Regarding food smuggling, the only official study carried out by the INE (but not published or officially presented) offers more precise data in this regard, and points out that in the year 2010 food smuggling exceeds US \$ 113.3 million. representing wheat, wheat flour and derivatives 61% of the total (US \$ 69.2 million); fresh and processed meats 11.9% (US \$ 13.5 million), followed by tubers (potatoes) with US \$ 13 million (11.3%); not to mention the smuggling of other direct consumer agricultural products such as vegetables, fruits, spices, and also processed products such as also processed products such as sugars, milk derivatives, oils and others (such as rice that in 2007 represented US \$ 30.8 million or 21% of the total contraband of that year) (see table No. 6 of the annex).

At present, the press permanently provides information on the magnitude of food smuggling, which, as previously stated, comes from different borders and depends on prices and times³⁴.

³⁴ For example. "... At the beginning of the current year, in an operation carried out at the Abapó town hall in Santa Cruz, the Customs seized around 300,000 tons of corn valued at \$ 50,000 that came from Argentina without any documentation." (01/11/2017 The Times)

A detailed study (Prudencio, Ton 2004) on the origin of foods marketed in the main markets of the country of foreign origin, indicates that the impact of smuggling on the price level paid to the producer is much greater than the impact on the consumer price. The prices in the level of stockpiling of the chain of intermediation are almost equal between the products of national and foreign origin³⁵. The smugglers do not pay the tariff levy and the value added tax (VAT) and sell without invoice to the merchants of the broad chain of intermediation, cataloged in the simplified regime.

4.2. Imports of agrochemicals

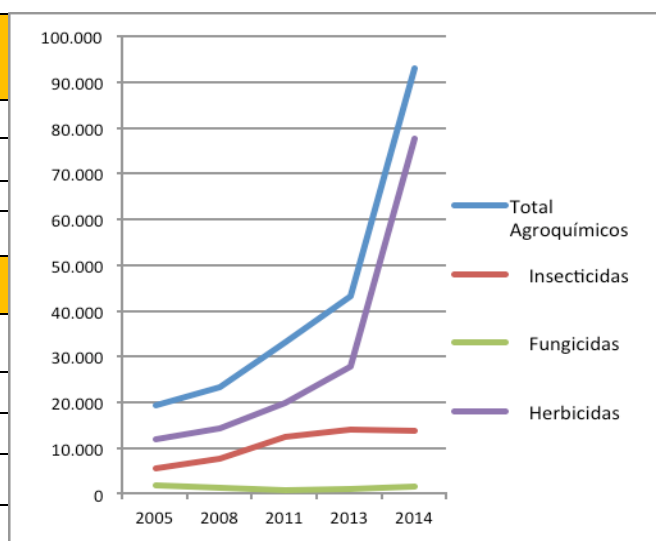
The imports of agrochemicals used for the internal production of food products-in the period analyzed- have had a permanent upward trend not only in quantity but also in value. They increased from 19,309 tons in 2005 to 92,922 tons in 2014³⁶, that is, they increased 4 times more in quantity and 5 times more in value, mainly due to the expansion of herbicides (in 2005 they represented 61% of the total of agrochemicals, in 2014 they represent 83.5%) (See table 6 and figure 9).

This means that in 2005/6; 7.34 kg per hectare were used, while in 2014/5, 24.91 kg/Ha were used, that is, they increased 3.3 times more. It also means, on average, that in 2005 there were 2.09 kg/agrochemicals per habitant, while in 2014 there was 8.71 Kg /agrochemicals/habitant, which shows an excessive and irrational consumption of agrochemicals.

Table No. 6 Evolution of agrochemical imports

Amount Imported(TM)	2005	2008	2011	2013	2014
Total Agrochemicals	19.309	23.266	33.059	43.042	92.922
Insecticidas	5.535	7.645	12.470	14.142	13.624
Fungicidas	1.945	1.246	876	1.050	1.640
Herbicidas	11.829	14.375	19.713	27.850	77.658
Import Value (thousand \$us)					
Total Agrochemicals	75.672	135.905	149.505	232.274	408.633
Insecticidas	22.841	57.787	92.384	129.779	131.345
Fungicidas	16.588	11.962	4.675	8.510	15.581
Herbicidas	36.243	66.156	52.446	93.985	261.707

Source: Built by the author based on APIA (2014) and INE



And ¿what are the causes for this excessive consumption and expansion of agrochemicals?

One of them is the expansion of transgenic crops such as soy, which increasingly needs the intensive use of herbicides (which in turn generates the apparition of new resistant weeds).

³⁵ However, the price differences for the merchant intermediary are high, depending on the products and the border posts (Prudencio J and Giel T. op.cit)

³⁶ For 2015 and 2016, the INE does not present statistics in this regard. However, APIA (Association of Suppliers of Agricultural Supplies) reports that in 2015 imports of herbicides would reach 129,212 tons, which would make a total of 142,000 tons of imported agrochemicals. Several institutions that work with farmers such as the PLAGBOL Foundation and PROBIOMA indicate that legal imports must be added between 30 and 35% for the annual contraband of agrochemicals

Another cause is the lack of control in the use of agrochemicals, many of them associated with risks of environmental contamination and health damage. "The pesticide folidol - the blue that is prohibited - is found in almost all the homes of farmers Approximately 540 tons of packaging are generated per year, which are a potential source of contamination ... a farmer generates approximately 30-40 kg / container/year ... 91% of those containers are thrown in the open air ... "(PLAGBOL." Healthy food and environment project-AMAS 2014-2016 ").

4.3 Agri-food exports

In the country, agri-food exports have gained impulse since the mid-1990s when they began to diversify and increase in volume, especially the ones from the east.

In the study period, it can be classified in 13 exported food groups that had a permanent rise in value between 2005 and 2013 (they increased more than 3.6 times) and after a short break in 2014. In 2015 they increase again to more than US \$ 1,625 million (see table 7 of the annex). In volume, there is also an increase but not as high as in the value because between 2005 and 2013, for example, the increase is 2.3 times more and by 2015, 1.3 times more. This means that the value of exports of food products increases in general terms, which would reflect the favorable variations in international prices.

In the 10 years analyzed, the group of oilseeds has always represented the first group of the total value exported (between 1/4 and 1/3 of total exports according to the years), and the group of fruits/preserved foods and derived, the second group (between 7% and 14% average according to the years).

If exports are considered according to their origin, most come **from the east** of the country (meats, corn, rice, sugar, soy, sunflower, sesame), especially from the agroindustry, and very few from the valleys and highlands, produced by peasant agriculture.

The *oilseeds* were and are the most important group in the total value of the set of agricultural exports. Inside this group, soybean (grains, flour, cake, oils³⁷) is the most significant product, with an upward trend in exports (from \$ 148 million in 2005 to almost \$ 383 million in 2014. That is to say that across the period, soy represents the 23% average of total national agricultural exports). Then there is the sunflower, sesame and others, which, depending on the price, are exported in the form of oil (sunflower) or seeds (sesame).

Regarding exports **from the valleys and altiplano**, generally produced by peasant producers, highlight coffee, cocoa, fruits (bananas, nuts) with many variations in export quantities and value, reflecting international prices. The quinoa is an exception that for some years experienced an exceptional success due to the rise in prices and international demand³⁸.

The expansion of exports and its impact on the formulation of Policies

The international prices of the demanded products have a series of implications at the level of the countries that export raw materials as is the case of Bolivia, influencing not only the productive aspects but also the national governments so that they modify governmental regulations and policies.

³⁷ Inside soy, it is more convenient to export in the form of oil than cake, grain or flour because their prices more than double.

³⁸ What in turn meant internally a non-sustainable exploitation and the destruction of the agro-silvo pastoral productive system (in this regard see Vassa Toral A. 2016, Ormachea E. 2016 among others).

In the case of the incidence in the governmental policies of Bolivia, a clear example is the situation of meat exports.

Among the representative exports from the east are meats (vaccines), whose exports were practically stagnant between 2006 and 2011 at around 2,000 tons/year, but in 2013 they more than doubled (5,020 tons), mainly due to the increase in the international price. In subsequent years, the volume exported decreased to 4,000 tons/year/average, but not because of a decrease in prices³⁹, but because of government policies that prioritized domestic and its consequent rise in the domestic sales price).

However, the permanent rise in the international price of meat is causing the eastern livestock companies to pressure the government to change its policy.

For example, they press for lifting restrictions on meat exports and price controls; for "the elimination of the Social Economic Function (SEF)⁴⁰ because there would be one animal for every 5 hectares; in the free access to fiscal lands; in the unrestricted release of exports and in the modification of the D.S. 26075⁴¹ in the use of lands"(Los Tiempos 01/04/2017).

That pressure was quite successful because some time later, the government suspended export restrictions⁴²; determined to expand the agricultural frontier (with crops and pastures), to condone illegal deforestation (favored by Law 337) and to postpone the fulfillment of the SEF for 2 more years.

The case of corn can also be mentioned as another example, due to its impact on foreign trade policies. In corn exports, the situation that is presented is contradictory and shows not only the high volatility of international prices but also the high permissiveness in the entry and exit of products from abroad.

Between 2008 and 2011, a large quantity of corn is imported (from 15,684 tons to 86,158 tons, 5.4 times more) due to the permanent decrease in prices (from US \$ 1,370/tm in 2006 to US \$ 386.78)/Tm in 2011), what allowed in turn to import large amounts of corn seed (from 15,684 tons in 2008 to 86,158 tons in 2011).

In 2013, the price of imported corn increased to 3,065.37 US \$ / Tm (8 times more than in 2011), so imports they went down brusquely , but exports increased to 29,811 MT (20.5 times more than in 2011). The same situation emerge in 2015 when international prices increase, imported volumes fall and export volumes increase, although in the domestic market there are problems in domestic production and provisions (in the feed industry for livestock and in the

³⁹ In 2006, the price of meat is US \$ 1,528 / Tm, in 2013 it is US \$ 3,200 / Tm, in 2015 it is US \$ 3,914 / Tm and "at the beginning of 2017 it oscillates between US \$ 3,000 / Tm and \$ 5,000 us / Tm, with the Russian market insured, which demands a large amount of meat "(Javier Landívar, general manager of the Santa Cruz-Fegasacruz Cattlemen's Federation, El Deber newspaper 01/23/2017)

⁴⁰ The Political Constitution of the State (PCS) establishes for the agricultural companies the fulfillment of the Social Economic Function (SEF), that is, that they invest in the sustaining of the land, in the conservation and in the protection of the biodiversity.

⁴¹ That norm the permanent forest production land, and that it involves areas with livestock characteristics, "...decree wrong prepared because it damage the sector " (J. Luis Vaca President of the Confederation of Livestock Breeders of Bolivia, Los Tiempos newspaper 03/04/2017).

⁴² Through the D.S. 3057 that allows the unrestricted exports of meat until XII / 2017 since he has planned the overproduction of meat above 13,000 tons (Los Tiempos 01/23/2017)

poultry industry, among others) which, in turn, generates the illegal importation (contraband) of the product to supply this needed industry⁴³.

The expansion of exports and its impact on food security

The growing international demand for certain products⁴⁴ has repercussions either on the income generated as well as on the use of agrochemicals, on the opening of the agricultural frontier, on the marketing system and also on the displacement of crops for basic consumption, among others.

As already analyzed in other articles⁴⁵, for example, in the department of Santa Cruz, the main region for the agricultural production of eastern Bolivia, the production and export of products - with transgenics especially and for the use of biofuels and cattle feed- generates a substitution of basic food crops, at the expense of productive diversity and the loss of traditional products.

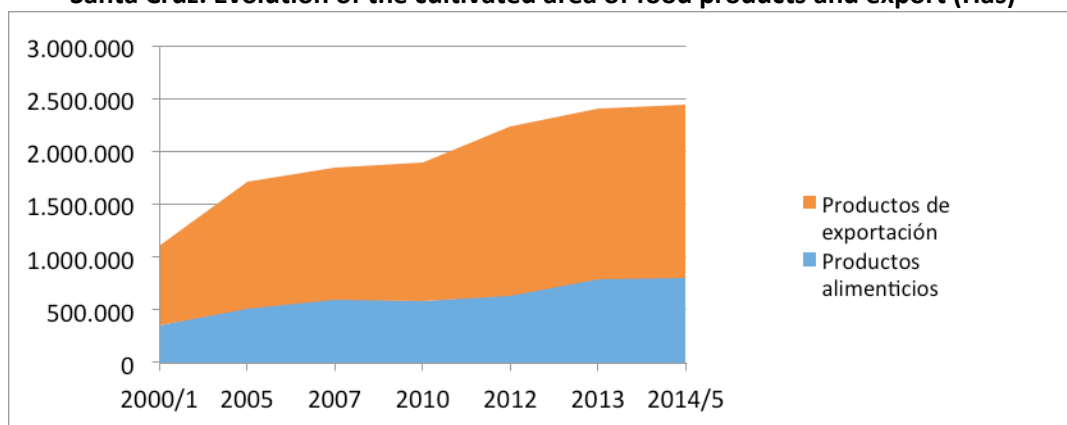
Between 2000/01 and 2014/15 the cultivated area increased from 1.1 million hectares to 2.5 million hectares. In 2000/01, basic crops (beans, peas, onions, tomatoes, corn, potatoes, cassava and even wheat and rice) represented 7.1% of the total cultivated, while export crops (sugar cane, sunflower, soy, sesame) 67.55%. In 2014/5, the same basic food crops represent 10.62% while export crops represent 71.38% of the total cultivated area.

Soybean⁴⁶ increased its cultivated area by more than 438,000 hectares between the years 2005-2014, while the potato - an essential product in the consumption of the Bolivian population - between 2005 and 2011 stay parked at 6,400 hectares, in 2014/5 increased to 9,572 hectares (that is, it increased only 3,000 hectares). Other principal crops (tomatoes, garlic, beans, cassava, barley grain) and even animal forage (alfalfa, barley cabbage) decreased in their cultivated area (Prudencio J. 2014).

Then, the cultivated areas of basic consumer products have been reduced in percentage by cultivating export products, which has a direct impact on the national provision, which is why imports must be used to satisfy domestic demand, thus losing national food sovereignty.

Graph 9

Santa Cruz. Evolution of the cultivated area of food products and export (Has)



Source: Built by the author based on MDRyT data

⁴³ What on the other hand shows the lack of protection in which the national industry is located

⁴⁴ Either for human consumption or as food for livestock or its use in biofuels

⁴⁵ In this regard see Prudencio J. (2014)

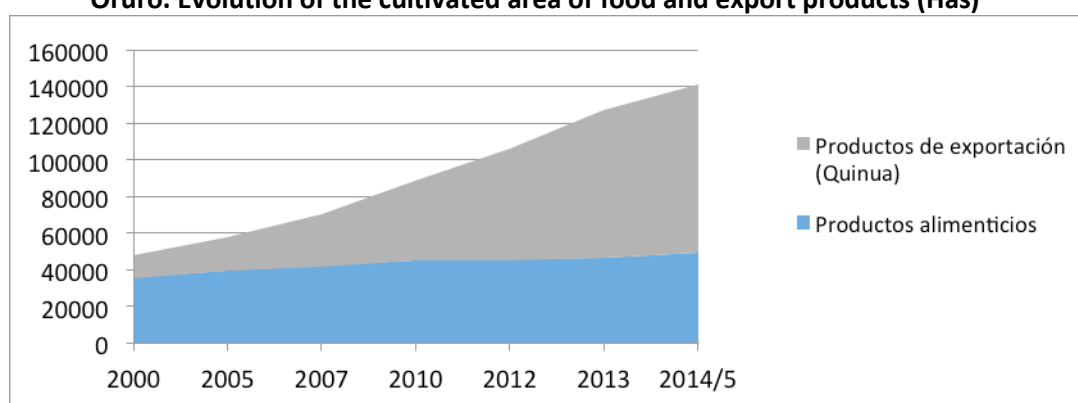
⁴⁶ That by 99% It is produced with transgenics. It is produced not only by agribusiness as in other countries (Brazil, Argentina) but also by medium-sized colonizing farmers - intercultural migrants from the west of the country who have mostly changed their traditional crops for soybeans.

Another example of this displacement of basic food crops for export products is the quinoa produced in the Bolivian highlands (Oruro and Potosí).

According to the MDRyT, in the last 15 years, the area seed with quinoa in Oruro increased 7.5 times more. In the year 2000, quinoa represented 25.5% of the total area seed in that department, while in 2014/15 it represented 65.29%.

The quinoa sown area increased significantly⁴⁷, while the area seed for all other products decreased. The potato (and derivatives) that in the 2000/2001 represented 19.93% of the total planted area, in 2013/14 represents 8.4% and 11.20% in 2014/2015 (Prudencio J. 2014). That is, they stopped growing potatoes to grow quinoa, which was mostly exported.

Graphic No. 10
Oruro. Evolution of the cultivated area of food and export products (Has)



Source: Built by the author based on MDRyT data

General consequences

In general terms, agrifood exports generate economic benefits⁴⁸, however there are a number of consequences that are usually not taken into account:

i) The substitution -as has just been analyzed- of consumer basic products for export products.

ii) Massive displacement of all the groups of basic products of the food basket for industrial crops (for export). The National Agricultural and Livestock Census (2013) shows that in the last 27 years (since the previous Agricultural Census), all food groups decreased (percentage) in their cultivated area at the expense of industrial products.

⁴⁷ Between 2005/6 and 2014/5 the area of quinoa planted increased 4.7 times more, while the total area sown in Oruro increased only 2.41 times more

⁴⁸ However, we have to ask ourselves: who benefits the most from these exports: the State? ... the municipal governments? ... the intermediary traders? .. the exporters? ... the agribusinessmen? ... the producers? ..the population in general? ... and in what percentages? And what was the destination of that profit? And how much was invested in improving the productive structure?

Table No. 7
Surface produced according to group of products (1986 and 2013)

Product group	1986		2013	
	Hectares produced (thousands)	%	Hectares produced (thousands)	%
Cereals	649	47.0	1.030	31
Stimulants	34	2.4	46	1
Fruit Trees	90	6.5	112	3
Vegetables	110	8.0	152	5
Industrial	174	12.6	1.648	50
Tubers	212	15.4	221	7
Forages	110	8.0	101	3
Totals	1.379	100	3.310	100

Source: CNA 2013

iii) Loss⁴⁹ of products rich in nutrients. For example, quinoa that has 2-3 times more amino acids than any other grain; it has more calories than milk, cheese, eggs, meats, fish; and more proteins and grease than milk for example (<https://www.vitonica.com/.../todo-sobre-la-quinoa-propiedades-b>) that could be used in their totality at the national level to eliminate malnutrition.

iv) Loss of forest areas. In 2000, Bolivia had 55 million hectares of forests and in 2010 it has 52.5 million hectares. (SERNAP 2015). Between 2012-2016 the average deforestation was 181,000 hs. The majority of this has been illegal and located mainly in Santa Cruz (<https://www.Authidad de Control y Fiscalización y Control Social de Bosques y Tierra ABT>).

This deforestation is caused by:

a) The expansion of soybean crops mainly (which went from 947,783 hectares in 2005/6 to 1,386,483 hectares in 2014/5) but also due to the expansion of transgenic corn, sugarcane (for alcohol) and others.

⁴⁹ "Loss" not only in terms of nutrients but also in terms of investment of income obtained. The majority of quinoa producers invested mainly in the purchase of last-model cars and vehicles (currently, several quinoa producers in the regions of Oruro and Potosí are debtors of automobile companies such as Toyota, Nissan and others), consuming unhealthy food (chickens, potato chips, junk products from Chilean contraband, and other fried foods) and did not invest in improving their productive structure.

Some of them invested in tractors to rent them per hour and thus planish the land, displacing the livestock auquéridos (llamas, alpacas) and without respecting the spaces that the certified organic production demands, between one crop and another. Due to the above, the Human Development Index (HDI) of the quinoa producing regions is still one of the worst in the country.

"The burger chain Burger King has been buying animal feed produced in the soy plantations in South America, mainly responsible for the burning of tropical forests in Brazil and Bolivia ... farmers carry out burning in the forest to grow soy for suppliers of Burger King, Cargill and Bunge, the only transnational operators in the area. The destruction of forest and tropical Savannah land is concentrated in the lowland forests of Bolivia and the Brazilian cerrado ... "

The Guardian 1st. March 2017
(reproduced by Page Siete 3/03/2017)

b) The expansion of livestock and the expectations of livestock agribusinesses (from Beni, Santa Cruz and Chaco) to obtain more profits now that international prices have increased, which drives them to import a large number of matrix, to plant new pastures and deforestation of large areas in the eastern region.

"The Santa Cruz farmers are ready to enter 100,000 matrix and deforestation 500,000 hectares to increase the herd by the Chiquitanía and part of the Chaco".

Fernando Menacho
Gerente FEGASACRUZ (Los Tiempos 14/X/2015)

"Las importaciones de matrices y las nuevas pasturas es parte del "Plan de Potenciamiento de ganadería en la Chiquitanía" con el objetivo de aumentar la producción...contempla lograr el 2015 el desmonte y la siembra de pasto de 200.000 Has y el ingreso de 500.000 matrices de raza Nelare"

The imports of matrix and the new pastures is part of the "Potentiation Plan of livestock in the Chiquitanía" with the aim of increasing the production ... it contemplates the 2015 the deforestation and the planting of grass of 200,000 Has and the entrance of 500,000 matrix of race Nelare

FEGASACRUZ
(Página Siete 13/X/2015)

This strategy of massive deforestation is not only at national level. Is part of a larger and international strategy, denounced by several institutions.

"Commercial agriculture generated almost 70% of deforestation in Latin America between 2000 and 2010. The expansion of pastures caused the loss of at least a third of the forests in 6 of the 7 countries analyzed ... commercial agriculture cannot continue growing at the expense of forests and natural resources in the region. "

Jorge Mesa, FAO Chief Forestry Officer (www.fao.org)

"Paraguay, Argentina and Bolivia fell trees 25 million during October 2015 in the shared Chaco region ... of that deforestation, 55% corresponds to Paraguayan territory, 34% to Argentina and 11% to Bolivia (2.75 million) The average daily deforestation that month in the Paraguayan zone of the region was 925 hectares, in Argentina it was 576 hectares and in Bolivia 185 hectares."

(www.GeoportalCartoChaco; Agencia EFE 27 / 1 / 2016)

"The key message of SOFO is clear: it is not necessary to cut down forests to produce more food."

Graziano Da Silva (Director General of FAO www.fao.org)

"Well-managed forests have enormous potential to promote food security. In addition to their vital ecological contributions, forests contribute to rural livelihoods and the alleviation of poverty through income generated through the production of forest goods and environmental services. "

"Forests play a key role in sustainable agricultural development through various ways, including the water cycle, soil conservation, carbon capture, and natural pest control, as well as influencing the local climate and protect the habitat of pollinators and other species. "

"The state of the world's forests" (SOFO), presented at the beginning of the 23rd period of sessions of the FAO Committee on Forests (COFO) on 07/31/2017 (www.fao.org).

V. THE AVAILABILITY OF FOOD AND NUTRIENTS

5.1. The availability of food.

Usually, when the availability of food is mentioned, reference is made to the totality of foods divided over the total number of habitants, which is not correct since all the products are mixed as if they were one, without knowing their origin and contribution caloric.

In an effort to advance the analysis and to have a more approximate view of the situation of the country in the period 2005-2015, the general balance of food and availability⁵⁰ by product was calculated (see table No. 8 of the annex).

If only the most important products of the population's food basket are considered (see the following table), only 6 products (meats, wheat flour, milk, sugar, fish and prepared foods) have increased their availability between 2005 - 2015 in an index a little higher than the growth of the population that increased 1.17 times in that period.

⁵⁰ Availability is determined based on the quantities available for consumption (C) which in turn is determined from production (P), imports (M) and exports (X), according to the equation $P + M = C + X$ where $C = P + M - X$.

The products that increased their availability the most are fish (from 2.42 g/pers/day to 4 g/pers/day/average) and prepared foods (from 6.7 g to 12 g/pers/day/prom), that is, increases of 60% and 56% respectively.

In the case of fish, the availability achieved annually (1.43 kg/person/year in 2015⁵¹) is far from obtain a minimum consumption of 45 kg/person/year recommended by international nutrition organizations.

This also shows that there were no incentives at national level to encourage the breeding, reproduction and consumption of fish varieties in which the country has ample possibilities. It also shows -as analyzed in the section on imports- that consumption corresponds to a social sector with high and / or medium income, located mainly in the urban sector, as we know, the rural inhabitant occasionally consumes river fish.

Regarding prepared foods, they are the result of an urbanized globalization model and the unrestricted opening to imports of all types of products, often unhealthy products called junk food, and that WHO has even cataloged as ultraprocessed products causing obesity/overweight (WHO/PAHO 2015).

The rest of the products that increased their availability are within the minimum levels or margins recommended by specialized institutions such as WHO / PAHO and FAO. In the case of meat, for example, the 32 kgs/pers/year/average achieved for 2015⁵² is very far from what has been achieved by developed countries⁵³, but within the acceptable parameters for a balanced diet.

In the case of milk, availability increased from 110 g / pers / day in 2005 to 152 g/pers/day in 2015⁵⁴. This increase is due to the policy of promoting milk production, to the incorporation of milk and derivatives in the rations of the different subsidies, to the growing urbanization⁵⁵, to the increase of derived products (yogurt, cheese, sweet of milk -dulce de leche- among others) and also to the expansion of the dairy industry⁵⁶.

Sugar has also had an increase in availability since it went from 37.3 Kgs / pers / average in 2005 to 41 kgs / pers / year in 2015 (or what is the same: from 104 grs / pers / day to 113 grs / pers / day). However, the excessive consumption of sugary foods (and beverages) that international diets imply is achieving a deterioration in health in terms of obesity and overweight, for which the WHO has just recommended that adequate consumption be only 25 grams. / pers / day since much of the sugars are "hidden" in other foods not considered sweet (in ketchup or tomato sauce for example).

⁵¹ The lowest consumption in South America and the Caribbean, comparable only to consumption in Guatemala (PAHO / WHO / FAO 2017).

⁵² Reference is made to the consumption of beef only because the consumption of pork meat is 5.5 Kgs/pers/year/average and that of chicken 35.57 Kgs /pers/year/prom in 2014/15 (Agroproductive Observatory of the MDRyT, La Razón 08/14/2016)

⁵³ Like USA that has an exaggerated consumption of 120 Kgs / pers / year / average (PAHO / WHO / FAO 2017)

⁵⁴ The lowest consumption in South America: 3.6 times less than consumption in Uruguay, Argentina or Ecuador according to WHO / PAHO / FAO (2017)

⁵⁵ The rural peasant population does not consume milk and derivatives (or does so in small quantities) not only because of lack of habits and custom but because of digestion problems and because of their lactose intolerance

⁵⁶ Especially of PIL (Milk Industrialization Plant -before Peruvian capital, today transnational capital) that monopolizes a large part of the national market

Table No. 8**Evolution of the availability of the main foods and Relations between variables (2005-2015)**

	Years	Meats	Wheath Flour	Rice	Tubers	Milk	Vegetables	Legumes	Sugar	Fruits	Fish See food	Prepared food
Availability	2005	29	41,65	57,89	n.d.	39,48	25,87	33,97	37,39	87,46	0.87	2,41
Kgs/pers/year	2015	32,26	44,57	48,29	114,97	54,56	31,20	31,50	40,76	83,77	1,43	4,38
Production/ Consumption	2005	1,00	25,96	0,99	n.d.	0,97	1,07	0,99	1,16	1,06	n.d.	.
	2015	0,98	54,45	0,92	n.d.	1,00	1,04	0,92	0,98	1,10	n.d.	-
Imports/ Consumption	2005	0,4	74,15	0,60	n.d.	3,41	1,58	1,24	2,59	3,42	100	107,18
	2015	2,23	45,54	7,88	n.d.	1,93	2,42	7,74	2,05	7,13	100	102,9
Imports(M) Production(P)	2005	0,004	286,0	0,0063	n.d.	0,035	0,014	0,012	0,022	0,032	-	22,44
	2015	0,02	83,63	0,085	n.d.	0,019	0,023	0,083	0,020	0,064	-	48,89
Exports(X)/ Production (P)	2005	0,004	0,012	0,0019	n.d.	0,0063	0,082	0,0027	0,16	0,090	-	0,16
	2015	0,012	0,00	0,0021	n.d.	0,027	0,065	4,12	4,67	0,16	-	1,40
Exports (-) Impors	2005	+ 0,08	-284,71	- 2,33	n.d.	-10,21	17,26	-3,07	+5787 5	49,58	- 8,05	- 22,28
	2015	-3,5	-219,75	-39,46	n.d.	+4,81	15,33	-26,28	-8047	98,44	-15,58	- 47,49
CDA=M/M+P	2005	0,4	74,15	0,63	n.d.	3,3	1,4	1,2	2,0	3,1	100	100
	2015	2,2	45,54	7,8	n.d.	1,8	2,2	7,7	2,0	6,0	100	100

Source: Prepared by the author based on Table No. 8 by the Annex

Wheat flour increased its availability from 41.6 kg/person/year (2005) to 44.5 kg/person/year (2015) partly due to imports and the EMAPA subsidy. This availability, which represents 124 grs/pers/day/average is very high for the population's consumption and contributes to an inadequate diet due to the excessive amount of carbohydrates⁵⁷.

The products that decreased their availability in the years considered are rice, legumes and fruits that are basic in human nutrition. Rice decreased from 58 kg/pers/year in 2005 to 48 kg/pers/year in 2015 (134 g/pers/day), although this index varies according to the region.

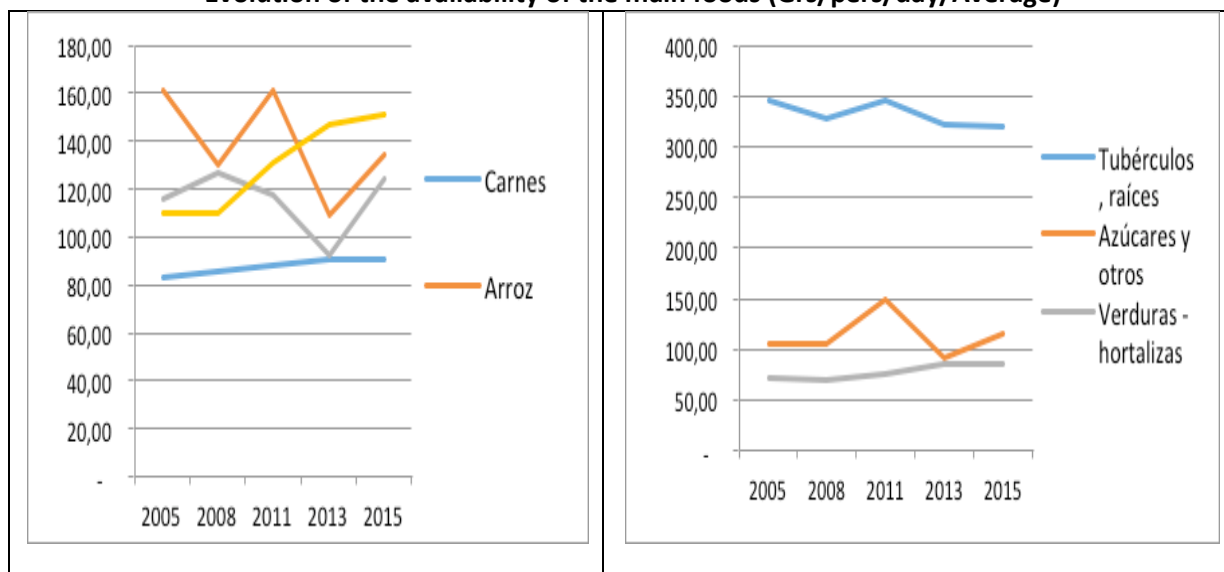
The legumes also decreased from 34 to 31.5 kgs/pers/year despite being recommended by the WHO/PAHO as fundamental products in the diet and health of the population due to their nutritional properties (they possess Vitamin B, minerals such as iron and calcium, fibers, help prevent diabetes, obesity, protect the heart and other properties).

Similarly, fruits also decreased in their availability from 87 to 84 kgs/pers/year/average, that is, from 243 g / pers / day to 233 g/pers/day being that the recommended consumption by the

⁵⁷ Recent studies of the School Nutrition Unit of the Municipal Government of La Paz indicate that the level of obesity and overweight of the students of the fiscal Educational Units in the municipality is very high due to the consumption of noodles, salchipapas, soft drinks among others, and also to the excessive consumption of wheat flour (pasta) mixed with fried food (La Razón 03/20/2017). 21% of students with overweight and 9% with obesity were registered in educational units of the municipality.

WHO for fruits is at least 400 g/pers/day⁵⁸, foods that also serve to prevent diabetes and obesity.

Graphic No. 11
Evolution of the availability of the main foods (Grs/pers/day/Average)



Source.- Built by the author based on table No. 8 of the annex

Provenance and vulnerability.

¿And where do the foods that are available to the population come from?

In the internal order, the origin is given according to the type of producer (classified by the size of its properties: large, medium and small) and according to the geographical location (altiplano, valleys, tropics) (see table No. 9 of the annex).

The principal tendency noted in the data in the table above is that during the years analyzed, most of the available food comes from small farmers⁵⁹ while the main export products come from the large producers.

It highlights that the sector of small peasant agriculture that ventures into exports (quinoa especially) has expanded. Likewise, a representative sector of them that moved to the east of the country (colonizers-intercultural) has changed their basic consumption crops (tomatoes, vegetables, rice) for soybean⁶⁰. The intercultural that have not ventured into soy (a minority), continue with traditional crops achieving productive yields and higher labor productivity than in their place of origin⁶¹.

⁵⁸ Actually the recommended 400 grams / day also include vegetables and fruits. However, if we consider the availability of both products in 2015, we would only reach a total of 315 grams / day / pers. (85 g of vegetables and 230 g of fruit, ie the 79% of what is recommended for both products). This consumption is higher than the average consumption of countries such as Nicaragua and Haiti, but lower than the average consumption of countries in the Andean region such as Peru, Ecuador and even Mexico (WHO / PAHO / FAO 2017).

⁵⁹ In 2015, small farmers in the east of the country produce 88% of the total rice, 72% of the beans, 87% of the corn, 87% of the yuca. In relation to 2005, its participation in rice, tomato, cassava and peanut production has decreased. Their participation in corn, coffee, beans, onions and potatoes remains the same.

⁶⁰ Although they have not yet managed to become exporters - their production is delivered to agroindustrial companies - they permanently request the government to export directly and thus optimize their economic benefits.

⁶¹ Due to climatic and environmental conditions, due to the availability of water and access to markets, among others.

In the case of large and medium producers, they contribute to the availability of food, with those products whose main destination is export, which is why they are more interested in increasing and diversifying these⁶² than in increasing and diversifying domestic availability.

Regarding the origin of foods of external origin, these vary according to the product (raw material or direct product for consumption) and according to the quantities.

Depending of the products, in some cases there is a high external vulnerability (case of wheat/ wheat flour) and in others a low vulnerability, although this is growing in recent years, as is the case of potatoes, tomatoes, Onion and other basic products.

In the case of basic consumer products, while domestic production stagnates (potato case) or decreases (case of tomato), imports increase strongly (9 times more in the case of potatoes and 16.5 times more in the case of Tomato). The result is stagnant (potato) or diminished availability (tomato) (see Table No. 9).

In other words, it can be said that in 2005, only 30 Bolivian citizens were supplied with imported potatoes, while in 2015, 271 Bolivians were supplied with imported potatoes. In the case of tomatoes, in 2005, there were 57 Bolivians who were supplied with imported tomatoes; in 2015, there were 942 Bolivians supplied with this imported product.

Table No. 9
Origin of the availability of some basic foods (2005-2015)

Product availability / years	2005	2008	2011	2013	2015
Wheat/Wheat flour (Tm)					
a. National wheat production (Tm)	138.445	201.508	249.668	217.404	364.951
b. National flour availability (72% extraction)	99.680	145.085	179.761	156.531	262.764
c. Wheat imports	209.184	88.880	80.375	145.243	6.245
d. Availability of imported wheat flour (72% extraction)	150.612,4	63.993,6	57.870	104.575	4.496,4
e. Imports of wheat flour (Tm)	135.373	235.271	193.680	86.834	215.259
f. Total availability of flour TM (b+d+e)	385.665,4	444.349,6	431.311	347.940	482.519,4
g. Total population	9.229.155	9.709.958	10.190.775	10.507.789	10.825.013
h. Total flour availability /person /year/kgs (f/g)	41,78	45,76	41,66	33,11	44,57
%of de flour of national origin	25,96	32,65	41,67	44.98	54,45
Potato (Tm)	2005	2008	2011	2013	2015

⁶² They continue to expand the area of export crops and due to the favorable international perspectives of prices and demand, they are entering the corn-soybean and livestock circuit, for which reason they are demanding the expansion of the eastern agricultural frontier; the paralysis of the SEF; the unrestricted opening of exports; greater openness to investments and the other aspects already mentioned.

National potato production	859.676	956.953	974.029	941.705	992.728
Imports of potatoes	2.809	23.354	22.445	24.488	25.530
Availability of potatoes (kgs/per/year)	93,5	101,3	97,8	92,0	94,1
Tomato (Tm)	2005	2008	2011	2013	2015
National tomato production	57.014	53.070	49.476	53.851	61.360
Tomato imports	354	304	873	2.424	5.842
Availability of tomato (kg/pers/year)	6,2	5,5	4,9	5,4	6,2

Source.- Built by the author based on data from INE

5.2. The availability of nutrients

The availability of nutrients for the average apparent consume of the population, whether in terms of calories, proteins and fats per person / day, shows a series of important variations to consider in the study period.

According to FAO statistics (FAO 2016), in 2004/5 there were 2,069 calories / person / day, that index increased in the following years to arrive at 2,254 Kcl / person / year in 2011-2013 (see table No. 10). This means that the degree of adequacy to the requirements increased from 0.87% to 0.94% average, without attain the adequate requirements in the level of calories.

The tendency in the availability of proteins is the same as that presented in the case of calories. From 2005-2006 there is a continuous increase of 57.58 g/pers/day to 65.61 g/pers/day (2011-2013), without attain the recommended level of consumption. In terms of the availability of fats, there was a gradual increase until 2008 and then decrease again in 2008-2009 and recover substantially in 2011-2013, attain 0.91% of what is required.

Table No. 10
Degree of adequacy of calorie, protein and fat consumption (2004-2013)

Years	Availability of calories	Requirement	Rank of adequacy	Availability of proteins	Requirement	Rank of adequacy (1)	Availability of fats	Requirement	Rank of adequacy (2)
	Kcal/pers/day	Kcal/pers/day	(%)	Grs/pers/day	Grs/pers/day	(%)	Grs/pers/day	Grs/pers/day	(%)
2011-13	2.254	2.378	0.94	65,61	59-89	0.88	54,66	40-79	0.91
2010-11	2.221	2.378	0.93	64.58	59-89	0.87	48,10	40-79	0.80
2009-10	2.155	2.378	0.90	62.64	59-89	0.84	46,73	40-79	0.78
2008-09	2.139	2.378	0.89	62.72	59-89	0.84	50,45	40-79	0.84
2007-08	2.145	2.378	0.90	62.64	59-89	0.84	49,12	40-79	0.82
2006-07	2.149	2.378	0.90	60.10	59-89	0.81	46,60	40-79	0.78
2005-06	2.121	2.378	0.89	57.58	59-89	0.77	45,28	40-79	0.76

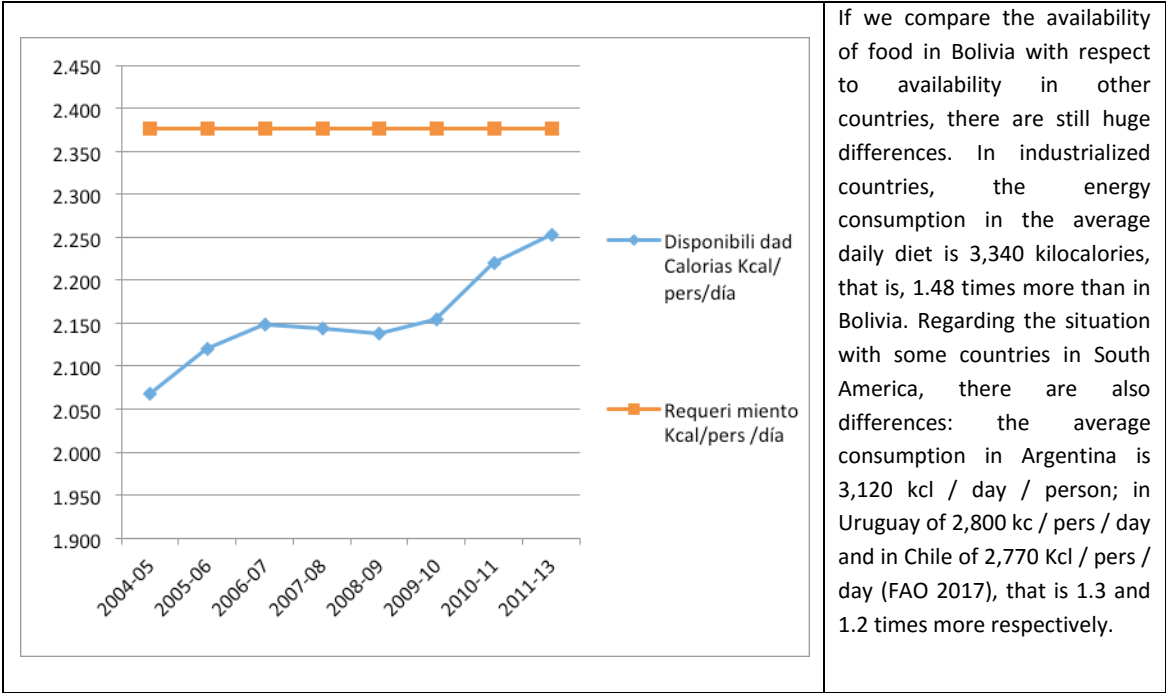
2004-05	2.069	2.378	0.87	s.d.					
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(1) The average of the two intervals (between 59 and 89) of the requirement is taken as an average (= 74)
(2) The average of the two intervals (between 40 and 79) of the requirement is taken as an average (= 59.5)
Source: Built by the author on the basis of data FAOSTAT and FAO 2016 (Panorama of food security nutrition 2016: Sustainable food systems to end hunger and poor nutrition)

In general terms, the food situation of the country is perturbing and deficient regarding the availability of person / day energy and its degree of adaptation to the necessary requirements.

Although the above statistics show an increasing trend throughout the study period (2005-2015), their values are below the minimum energy requirements estimated at 2,378 Kcal/ person/day; below the proteins/person/day estimated at 74 grs/person/day/average and below the fat / person/day estimated at 59.5 grs/person/day as the following graphs show. In other words, in no year has availability obtained achieved the value of the regulatory requirements established by specialized international organizations.

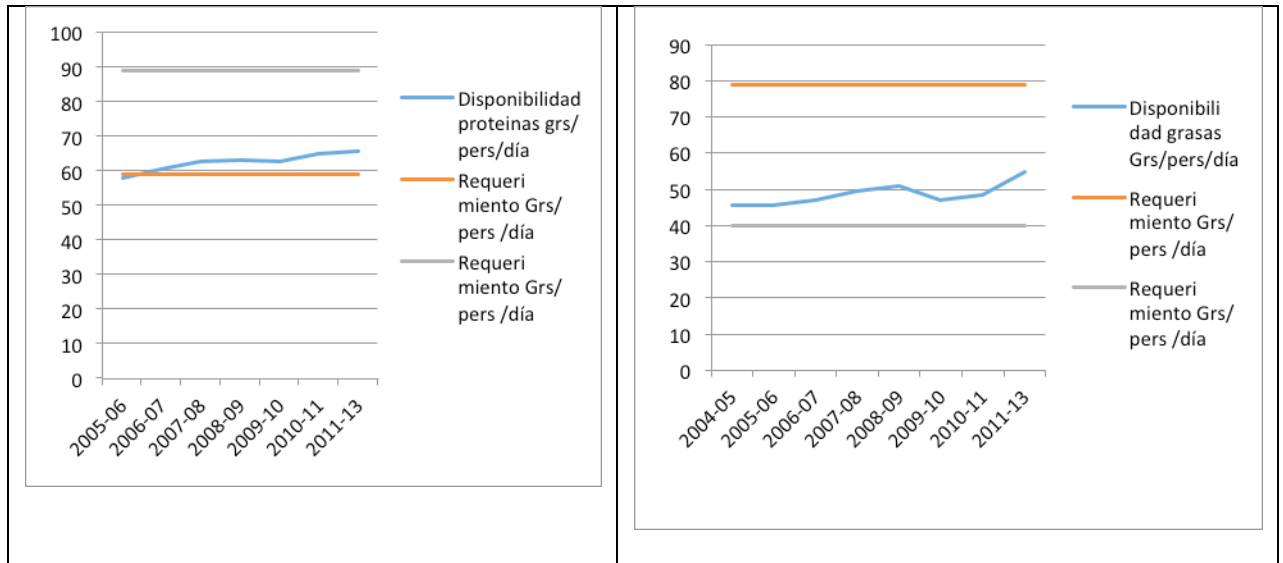
Graph No. 12
Evolution of the availability of kilocalories person / day



If we compare the availability of food in Bolivia with respect to availability in other countries, there are still huge differences. In industrialized countries, the energy consumption in the average daily diet is 3,340 kilocalories, that is, 1.48 times more than in Bolivia. Regarding the situation with some countries in South America, there are also differences: the average consumption in Argentina is 3,120 kcl / day / person; in Uruguay of 2,800 kc / pers / day and in Chile of 2,770 Kcl / pers / day (FAO 2017), that is 1.3 and 1.2 times more respectively.

Graphic No. 13

Evolution of the availability of proteins and fats according to requirements (grs / pers / day)



Source.- Built by the author based on table No.10

On the other hand, the information provided by the FAO does not specify which products are the contributions in each of the nutrients, however if we use the data in table 9 of the annex we can determine the origin of these contributions.

If we compare the data of the 2015 food composition in terms of kilocalories with the food composition of 2005 (see table No. 11) it highlights that the availability of kilocalories / person / day from cereals is quite high, much more than necessary. Similarly, it highlights that as the years pass, this availability of the cereals increases between 2005 and 2015 by 15% as opposed to a decrease in the proportion of calories from vegetables and tubers.

The major contribution of calories is thus concentrated in 3 food groups: in cereals, in dairy products and in vegetables that concentrate a high percentage of the total availability of calories.

Regarding the group of proteins, in 2005 the greatest availability comes from the group of cereals, followed then by the group of legumes. For 2015, although the highest availability of proteins continues to come from cereals, meats have had an important increase in the years considered, occupying the second place with an increase of 8% compared to 2005. Parallel, the contribution of proteins has decreased from tubers and legumes, and the protein intake of vegetables, potatoes and tomatoes remains the same.

In terms of the availability of fats, between 2005 and 2015, the increase in the groups of meats as well as dairy products (especially milk) stands out. On the other hand, in fibers, availability between 2005 and 2015 remains stationary in all product groups.

All this situation of calories and proteins shows that in the country there is a strong process of nutritional transition in the 10 years considered.

Table No. 11
The composition of the main foods (2005-2015)

Products/ products group	Energy (Kcal)		Proteins (Grs)		Fat (grs)		Fiber (Grs)	
	2005	2015	2005	2015	2005	2015	2005	2015
Meats	86,94	94,10	17,64	19,09	1,32	1,43	-	-
Cereals	2.565,91	2.944,31	55,91	64,15	5,02	5,76	3,29	3,29
Cereal derivatives	379,22	270,24	11,25	8,02	2,14	1,53	1,15	1,15
Dairy products	70,62	95,68	3,48	4,71	3,92	5,32	-	-
Tubers	334,41	309,78	7,24	6,71	0,34	0,32	1,92	1,92
Sugars	398,86	434,81	-	-	-	-	-	-
Vegetables	13,66	16,47	0,58	0,69	0,14	0,17	0,69	0,69
Legumes	326,57	302,82	21,43	19,87	1,23	1,14	-	-
Wheat Flour	276,61	195,4	6,20	5,80	1,56	1,10	0,83	0,83
Potatoes	251,80	253,45	5,45	5,49	0,26	0,26	1,57	1,57
Tomatoes	3,28	3,28	0,14	0,14	0,03	0,03	0,14	0,14
Milk	69,09	95,50	3,40	4,70	3,84	5,31	-	-

Source: Prepared based on data from the INE and Table of Food Composition-2009

5.3. The consumption of food in low-income families: Case study.

The levels of food consumption constitute one of the most important indicators of the socioeconomic conditions of the population. They allow us to evaluate, with relative objectivity, the level of family life, also offering the possibility of knowing to the extent that income levels and social conditions allow it, a basic need such as food and nutrition.

The absence of official information on the actual consumption of food by Bolivian families prevents an analysis at the micro level (complementary to the macro analysis) on the specific and real consumption of the population in general⁶³.

However, to correct this deficiency, we go to case studies carried out under a certain scientific and academic level, which allow us to get closer and understand better this situation. For this purpose, recent research on the population of the city of El Alto de La Paz⁶⁴, which exemplify the current situation of a large sector of the Bolivian population, is considered.

⁶³ As is known, consumption depends on many factors such as the level of income, food habits, the composition of families (number of members, age, sex, activities developed), the distribution of meals to inside of the families, of the frequency of the meals, of the proximity to the centers of supply, of the location of the family according to region/sector (rural / urban) and of other factors.

⁶⁴ "Factors that influence the composition of the basic food basket of families in the city of El Alto." Master's Thesis in Food and Nutritional Security. María Gladys Espejo. Faculty of Medicine, Nursing, Nutrition and Medical Technology /Post Graduate Unit. Universidad Mayor de San Andrés (UMSA) 2015, La Paz. This research was carried out in 7 districts in El Alto de La Paz, corresponding to the North, West and South areas of said city, to 422 families through interviews according to occupation, income level, housing conditions, degree of instruction and Consumption reminder of the last 24 hours. These interviews were conducted at the end of 2012

According to the research, the composition of the current basic food basket of the population in El Alto de La Paz is composed of between 19 and 22 products on average, with the main products being sugar, bread, oil, among others, as the table indicates No. 12.

One aspect to highlight in this issue is the reduction in the number of products that make up the basket since according to other previous research⁶⁵, the components of a food basket in El Alto ranged from 26 (in the 1st of May zone) and 30 products (Zone July 16).

Despite the years passed and the amelioration in the level of income of the population, the higher educational level, the increase in health infrastructure, the advances in food processing and others, the number (diversity) of products to be consumed has diminished.

Table No. 12
Main products of the food basket in El Alto de La Paz
(listed according to frequency order) (2012)

1. Sugar	8. Onion	14. Noodles
2. Bread	9. Egg	15. Tea
3. Oil	10. Pumpkin	16. Yellow pepper
4. Potato	11. Banana	17. Salt
5. Carrots	12. Chuño	18. Vegetables
6. Meat (beef, chicken)	13. Tomato	19. Flour
7. Rice		

Source.- Espejo María G. 2015

The results of the research indicated also show that of the total food components of the food basket, 38% correspond to energy, 28% to the protectors (preferably vegetables), and the rest to trainers and stimulants (17% each one).

The frequency of consumption. The highest daily frequency of food consumption (for more than 50% of families) are meats, tubers and roots, various vegetables, bread, cereals, oil and sugar. 38.4% of families consume fruits and a little more than a quarter of the studied population consumes eggs. Less than 10% of families consume fish, dairy products and derivatives daily. On the other hand, 37% of families do not consume legumes, 44% do not consume milk powder and 40% do not consume sausages and giblets, especially due to the high price and consumption habits.

The frequency of purchases of food for their respective preparation at home is mostly on a weekly basis (61% of the population buys chickens and vegetables, 54% buys fruits, 43% buys tubers/roots and vegetables; 41% herbs and mates, 38% eggs).

Biweekly and monthly purchases are more related to non-perishable products such as oil, wheat flour, cheese, salt. There are also annual purchases (sugar, some cereals). The products that are almost never bought are powder milk, sausages and coffee. The only product that is bought daily by all the inhabitants is bread.

⁶⁵ See Prudencio J. and Velasco M. "The defense of consumption. Crisis of food supply and survival strategies" Edic. CERES 1987, La Paz. Villegas R, Franqueville A, Justiniano Y. "Food and nutrition in the city of El Alto. An analysis based on the family budget survey, Bolivia "La Paz, 1994

The consumption of food. In nutritional terms, the study indicates that the average consumption/person/day is 2,273.81 kilocalories, 64.32 proteins and 77.33 fats, highlighting that there is a low consumption of calcium (which reaches 429.8 mg, ie 39.1% of the recommended) and zinc (9.5 mg, which represents 77.7% of that recommended by the MSD / 2007).

Of the total calories consumed / person / day, 83.3% come from consumption within the household and the residue (16.7%) comes from consumption outside the home. In terms of proteins, 82.9% come from the home and 17.1% from meals made outside the home.

If these consumption data are related to the national average consumption data and the recommended consumption, the consumption in the families of El Alto is practically similar to the national average, both in terms of kilocalories and proteins, and higher in terms of fat consumption.

Relating to the consumption of a few years ago - in the same type of population and city - there is currently a significant increase. Some studies indicate that in 1980 the consumption of low-income families in El Alto de La Paz was 1,476 Kcal / pers / day / average (Villegas, Franqueville et al 1994) while in 1985, 85% of the population consumed less of 1,999 calories (Prudencio, Velasco 1987). In 1986, another study (Franqueville, Aguilar 1987) highlights that the average consumption in El Alto was 1,369 kilocalories⁶⁶.

The number of meals. In general, these are 5 a day in most of the population (breakfast, sahra hora or mid-morning meal, lunch, tea and dinner) although for reasons of work and distance, 3 are the principal main meals.

In the breakfast, 92.7% of the population has an inadequate consumption⁶⁷, being located most of these (45%) in the zone of lower level of income (North), and a minority (17.5%) in the South zone where there is more income level.

Regarding lunch, 87% of the population has an adequate consumption while 13% presents an inadequate consumption. At dinner, 58.5% have adequate consumption and the residue (41.5%) presents an inadequate consumption.

Access to food and supply strategies. The families studied in El Alto, to access food, develop a series of strategies: i) get food products from their own production in the rural sector, especially potatoes, herbs and some cereals; ii) avoid the purchase of high-priced products (powder milk legumes, sausages and offal, and fish), iii) buy wholesale products (tubers, sugar, rice, oil) to lower prices by requiring the "llapa" , iv) make purchases in places near the home⁶⁸ to avoid the cost of transport and, v) buy in cheaper places (30% of the families interviewed make their food purchases at local fairs, 26% buy in markets and 21% in neighborhood stores) (Espejo MG 2015).

⁶⁶ This low consumption can also be explained by the hyperinflation and the crisis of lack of food that the country experienced during those years.

⁶⁷ The study defines as adequate consumption when the 3 food groups are consumed, and inadequate when only 1 or 2 food groups are consumed.

⁶⁸ This proximity refers to prices only and not to a good diet because according to the study, 99% of the families studied have a direct physical access to food, however 80% of them have an inadequate diet. The rest of the families (1%) have an indirect physical access to food, but less than 50% of them have an adequate diet in nutritional terms.

On the strategies of access to food, it is good to remember that these are elaborated mainly based on the socioeconomic situation of people and families inventing new strategies if the situation demands it, readapting others or simply re-implementing old strategies.

From the reading of the strategies mentioned that are implemented in El Alto, it can be concluded that these families are going through a relatively adequate economic situation, since 4 of the 5 strategies mentioned are linked to the market.

The low variation in the prices of basic foods in recent years (due to EMAPA's projects, for subsidies, and by sales at fairs of "weight and fair price", among others) as well as the series of income supports family (annual increase of basic salary, the 2nd annual bonus, various subsidies, school breakfast, etc) have affected so the population have more economic resources, so they are incorporated more into the market as purchaser, and have not seen forced to adopt new strategies of access to food⁶⁹.

This does not mean that at present there are no families that produce their own food (vegetables in solar tents, what is called urban agriculture); that breed small animals (chickens, rabbits, guinea pigs); that they exchange products or that they carry out unprofitable work times (in monetary terms). Other strategies also persist such as bringing food from the countryside⁷⁰ and modifying the consumption of food⁷¹ but not as massively as in the 80s.

The family budget in the consumption of food. The study on the populations in El Alto de La Paz also calculates the consumption according to the level of income of the population⁷², highlighting that in the high *level of income* (families located in districts 1 and 2), between 84% and 92% of the population has an inadequate consumption⁷³, this is that only between 4 and 8 people out of 50, have an adequate consumption while in the low level (districts 4, 5, 6 and 7) the 95.6% average of the population has a consumption inadequate, or that 4 out of 100 consume properly (Espejo MG 2015).

The above data show that adequate consumption⁷⁴ does not depend on the level of economic income, but rather corresponds to other factors such as food habits and / or knowledge of adequate nutrition by the population.

Regarding *expenditures on food*, the study notes that low-income families spend between 51% and 75% of their total income on food while high-income families spend less than 25% of their income (and the average income between 25% and 50%), thus reaffirming the law formulated

⁶⁹ As for example in the 80s when there was a hyperinflation, a daily increase in the prices of basic products, occultation and speculation. Families implemented strategies such as accessing food donations through mothers' clubs, assistance to soup kitchens, preparing food to sell on the street and others.

⁷⁰ As the potato, although for consumption only. Before, they even brought for the exchange and sale. In addition, exchanges of products were frequent: they received agricultural products (rich in proteins and vitamins such as eggs and fruits that were consumed directly and not marketed) and delivered processed foods or material goods.

⁷¹ As a way of improving - supposedly - feeding since for example no family declares to consume lamb meat as was very usual in the past, or Karachi fish, or use lard instead of oil for the preparation of food (as yet they do it in impoverished rural regions).

⁷² The majority of the families studied are of limited economic resources. Within them, the investigation determined 3 levels: high (3.3% of the sample, located as employers and small industrialists), medium (36.7% of the sample: employees, workers and self-employed) and low (60% of the sample: students, domestic workers), unemployed and retired).

⁷³ Defining the adequate consumption to the consumption of the three types of products: trainers, energy and protective

⁷⁴ In the case of breakfast, for example, 95% of high-income families and 95.6% of low-income families have inadequate consumption.

by Engel in 1857 that argues that the poorer a family, the greater proportion of its total income goes to food.

Feeding expenses of low-income families (between 51% and 75% of their income) are included in margins less than the margins that poor populations had in El Alto three decades ago.

The detailed study on food and supply (Prudencio / Velasco 1987) shows that the structure of spending on food consumption of poor families⁷⁵ ranged between 65.1% and 82.6% of the total expenses, that would come to reaffirm that the current socioeconomic situation is better than the previous situation.

Regarding the type of products purchased for consumption in the home, only 51% of families buy the 3 food groups (energetic, training and protective), 31% of families buy 2 food groups (energetic and trainers) and 18% of families buy a food group (energy), which shows in general terms that families do not have much knowledge or training in terms of nutrition.

These results of the case studies allow to reaffirm the main trends of the macroeconomic analysis carried out previously and also show the family situation with necessary details for a more complete view of the state of the feeding / nutrition of the families as well as their level of education / training and the management of the family budget.

5.4. Malnutrition and other health indicators

A fundamental aspect in the global analysis is the one referring to the nutritional status of the Bolivian population. According to the latest data available from Health Ministry and the Zero Malnutrition Multisector Program (PMDC), *chronic malnutrition of children under 2 years of age* shows substantial progress between 2007 and 2012⁷⁶ as it decreased to an average of 5.2% year, which means that chronic malnutrition affects 16.8% of the population (23.2% in the rural sector and 13.4% in the urban sector) (Fte.- CTB / Ministry of Health 2015).

This progress is noteworthy because the Millennium Goal established for 2015⁷⁷ was exceeded, however at the level of departments and income levels, the situation is different.

Although at the national level the Millennium Goal established for 2015 was attained, at the departmental level significant breaches are observed. In 2008, the departments of Santa Cruz (11.2%), Tarija (13.9%), Beni (19.7%) and Pando (15.0%) would have met the Millennium Development Goal; however, the departments of Potosí (42.5%), Oruro (35.3%) and Chuquisaca (34.1%) still have significant breaches with respect to the Target (21%) of 2015 "(UDAPE 2015).

At the level of income, the same source cited highlights that large differences persist between income quintiles. The proportion of children under three who suffer from chronic malnutrition is 3 times higher in the poorest quintile than in the richest quintile of the population, due to income inequalities as well as access to and utilization of public services (UDAPE 2015).

Another source of national information also highlights that chronic malnutrition among children under 5 has decreased from 26.4% to 18.1% between 2008 and 2012; in the urban

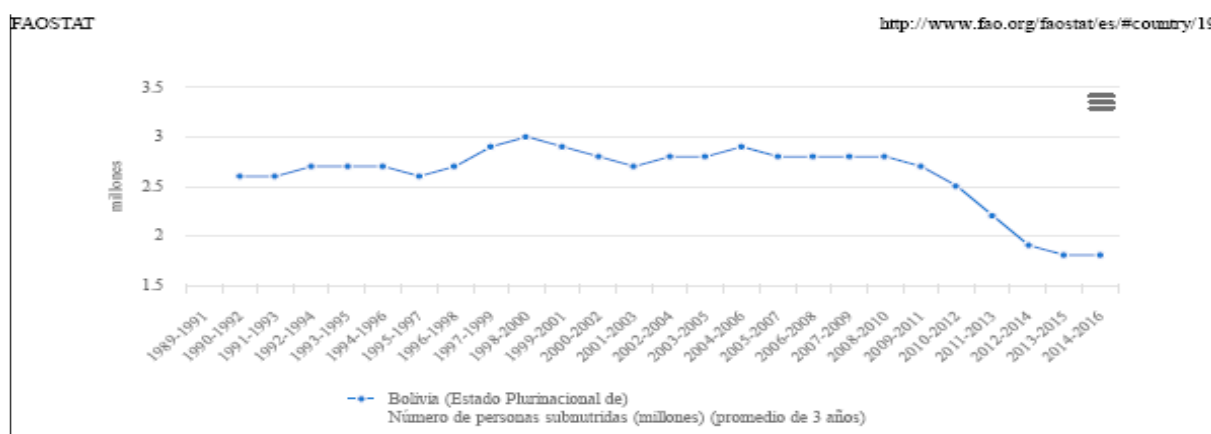
⁷⁵ From the areas of San José Carpinteros, Primero de Mayo, San Luis Pampa and Villa 16 de Julio in El Alto

⁷⁶ The information to 2012 is the most up-to-date available, although it is known that in 2015 a new ENSA was carried out, the results of which are not published or disseminated by the Ministry of Health.

⁷⁷ The goal for 2015 was to reduce up to 21% nationally ("Objetivos de Desarrollo del Milenio en Bolivia. Octavo Informe de Progreso" UDAPE, Comité Interinstitucional de las Metas de Desarrollo del Milenio. 2015).

area from 17.3% (2008) to 14.6% (2012) and from 37.2% to 25.9% in the rural area (Health Ministry 2016).

Graph No. 14
Bolivia Evolution of undernourished people



Other health indicators (Ministry of Health 2016) show that this same population has 60% of anemia and 7.5% of overweight (2012), levels very similar to the population of children under 2 years (which present 60.5% with anemia and 7.1% with overweight).

In the case of women, the information is not updated, however in 2008 malnutrition was 2% in women between 14 and 49 years of age, and 49.4% of pregnant women had anemia (ENDSA 2008).

On the other hand, recent reports show that maternal mortality arrive at 160 x 100,000 live births, among whose causes are hemorrhage (37%) that is related to the nutritional status of pregnant mothers (Ministry of Health 2011).

Finally, 56.9% of adults at the urban level have access to health services and 53.9% in the rural sector (SPAN 2011); and to 2014, 60% of this age group is overweight and obese (Ministry of Health 2016).

Overweight and obesity.

Finally, it is clear that while malnutrition and hunger have decreased in the country, the rates of obesity and overweight are increasing significantly.

According to the Epidemiology Unit of the Ministry of Health, in 1997, people with overweight and obesity made up 21.1% of the total Bolivian population, in 2017 they represent 42.7%⁷⁸ that is to say that in 20 years more than doubled the population with overweight and obesity.

This source also highlights that every year more than 65,000 cases of obesity and overweight are reported. In 2014, 60,658 were reported; in 2015, 71,541 were reported and in 2016 there

⁷⁸ Epidemiology Unit of the Ministry of Health and Sports.

were 75,290, most of them located in the city of Santa Cruz, and then in Cochabamba and La Paz.

Average chicken consumption	No. Obesity cases	"... consumption with a high content of fats, sugar, salt and, in addition, fried foods and sodas, are the causes for weight gain and obesity ... a chicken portion represents 300 c; a hamburger 350 c; a portion of French fries 300 c. and a soda 150 c. "
2005 17,00 Kgs/persona/año	-	
2013 25,80 Kgs/persona/año	-	
2014 35,57 Kgs/persona/año	60.658	
2015 n.d.	71.541	
2016 42,59 Kgs/persona/año	75.290	
Fte. OAP (MDRyT) y MSD		<p style="text-align: center;">Adolfo Zárate National Head of the Unit of Epidemiology of the Ministry of Health and Sports (La Razón, 09/18/2017)</p>
The annual increase in the availability of 1 kilo of chicken person / day also implies -among other products- that 2,090 new cases of obesity and overweight are reported per year, between 2014 and 2016.		

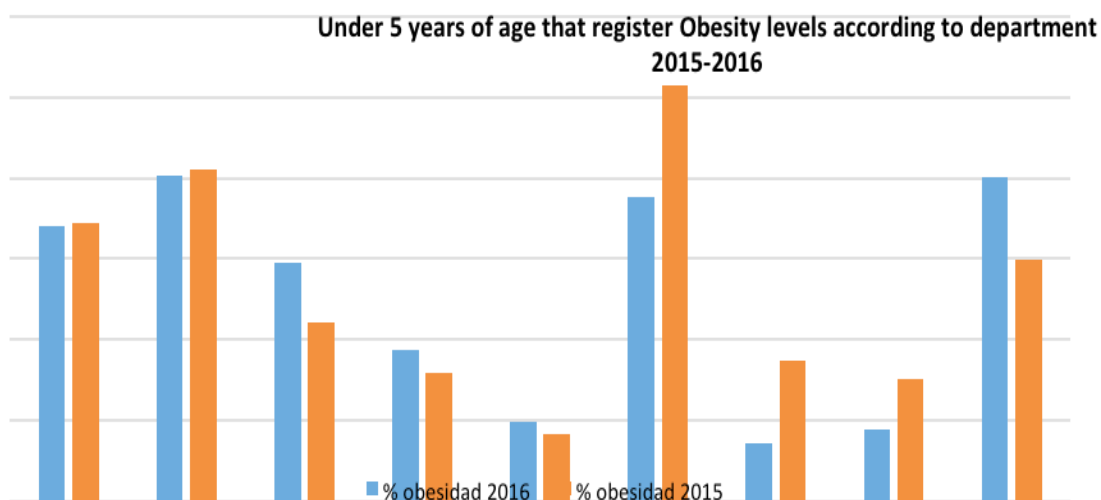
But the biggest impact of obesity and overweight occurs in the case of women and an upward trend in children.

According to the 2008 ENDSA, 49.7% of women between 15 and 49 years of age have a Body Mass Index above 25, which represents overweight and obesity.

According to the Multisectoral Food and Nutrition Plan, children under 2 and 5 years of age are overweight by 7.1% and 7.5% respectively, being more pronounced in the departments of Tarija, La Paz and Pando.

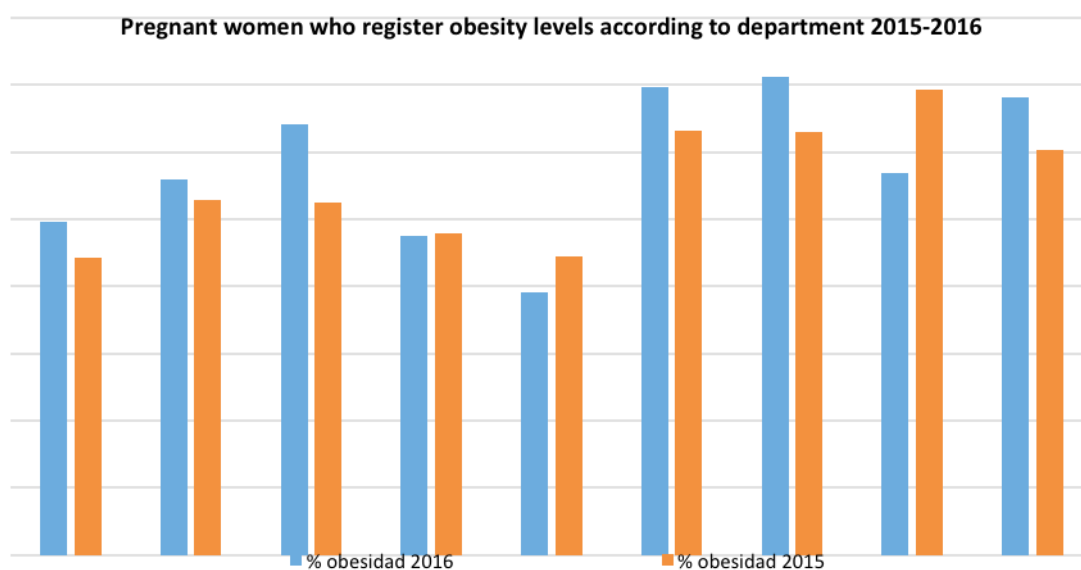
With regard to older children (students), 27.1% have overweight or obesity, being more pronounced overweight in female students than in men (25.3% and 19.8% respectively) and more male students obesity than in women (5.3% and 4.1%) (ESNUT 2012).

Graphic No. 15



Source.- built by Alvarez Cecilia (MpD / UCB) based on WWW.MSD,

Graphic No. 16



Source.- Alvarez Cecilia (MpD/UCB) en base a WWW.MSD.

Overweight and obesity are mainly due to the fact that less and less (relatively) basic products are being produced, that productive diversity is being lost due to the production of export products, that there is no support for the rescue of seeds of traditional products, and that the temporality and alternation of crops is being lost, all of which influences the disconnection with traditional nutrient-rich eating habits.

To all this must be added that there is a strong influence to consume "universal diets" or ultra-processed foods⁷⁹ (commonly called food scrap), ready to heat and consume, which have invaded the national market and are promoted by the various media, by supermarkets and fast food restaurants and import merchants.

Finally, this is compounded by the fact that government authorities consider the economic model to be a great success if people go out to eat more frequently⁸⁰ outside the home; that the value of supermarket sales has increased and that people consume more chickens⁸¹ (fed hormones and prepared in an insane-fried way).

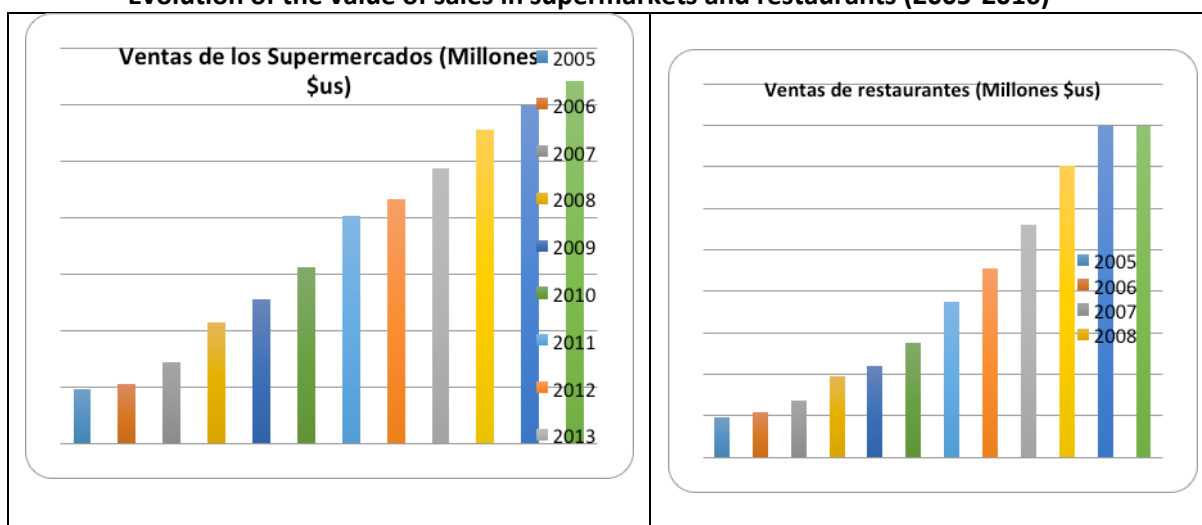
⁷⁹ Ultra-processed foods are problematic for human health for different reasons: they have a very poor nutritional quality and, in general, they are extremely tasty, sometimes almost addictive; they imitate food and are mistakenly seen as healthy; encourage the consumption of snacks; advertise and market aggressively; and they are culturally, socially, economically and environmentally destructive. The penetration in the market of several of the main ultraprocessed products is oligopolistic and is generally dominated by multinational companies. The growing concentration and domination of the world economy by rich food companies raises serious concerns about its marketing power and its influence on consumers, as well as its political power vis-à-vis Nation-States and the consequent capacity to influence policies. affecting the food supply and the consumption of food products "(FAO (2016)" Map of hunger 2015 "

⁸⁰ According to the (ex) Minister of Finance, Luis Arce Catacora ... " ... the family would not go out on Sundays to eat out and would not go to the supermarkets if the economy had not improved it would go to open markets where it is cheaper" (La Reason 06/15/2014)

⁸¹ "There is an increase in the consumption of chicken meat, from 17 kgs / person / year in 2005 to 25.8 kgs / person / year in 2013" (Report of the 2013 Management of President Evo Morales A. to the People of Bolivia "- Separata de La Razón 01/22/2014).

According to the Agroenvironmental and Productive Observatory (APO) of the MDRyT, "In 2014, the average consumption of chicken per person in Bolivia is 35.57 kgs in the city of La Paz it reached 62.4 kgs/person/year" (The Reason 07/15/2015). More recent data from the APO/MDRyT indicate that in Bolivia the consumption of

Graphic No. 17
Evolution of the value of sales in supermarkets and restaurants (2005-2016)



Source: Ministry of Economy and Finance. "Economic Situation in Bolivia 2016". La Paz

IV.FOOD PRICES (Access)

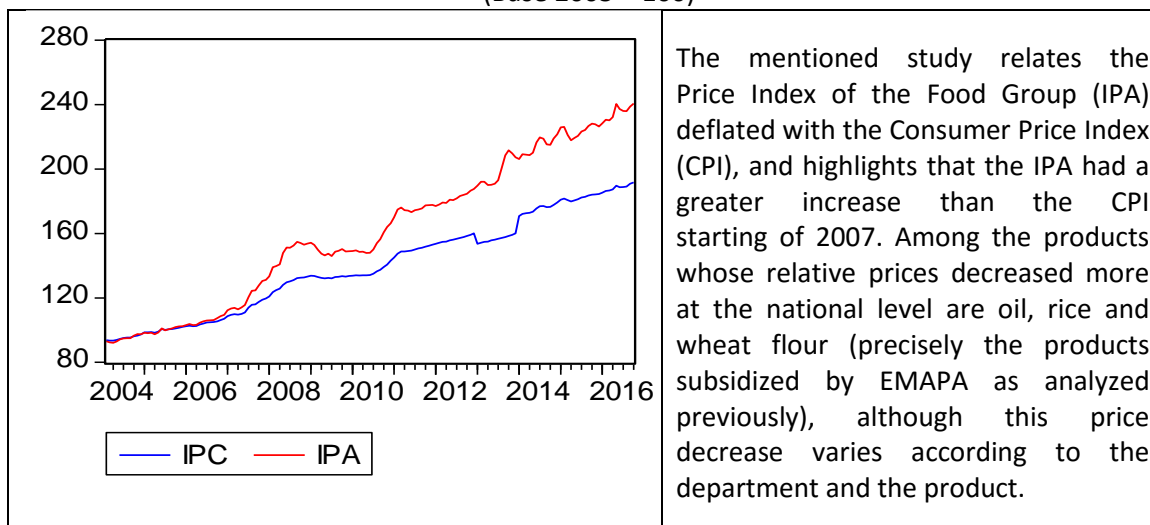
A final aspect to be considered in the analysis - which complements the above - is the one referred to food prices and the management of these by government policies, which allowed, in part, for the population to access more food.

The growth of the economy in the years under consideration and especially the different income redistribution measures such as the annual increments of the basic salary, the direct transfers (Renta Dignidad, Juana Azurduy Bonus, Juancito Pinto Bonus, pre-lactation subsidies, etc.) and remittances from abroad have made it possible to improve the situation of several thousand Bolivian families that have left poverty levels, reducing extreme poverty from 38.2% (2005) to 16.8% (2015) (www.INE.gob.bo).

A recent study (JA Morales 2017, in "Strategic review of food security in ..." op.cit MpD / UCB, La Paz) on food prices highlights that the distribution of income and the increase of these has allowed the population access to more food, despite the increase in food prices between 2008 and 2015 was 33.25% average at the departmental level.

chickens nationwide rose 2017 to 42.59 Kgs/Pers/year/average (04/17/2017 La Razón) which means that Bolivia is the second country in ALT consuming chickens after Brazil (45 Kgs /pers /year) and above Venezuela (41 Kgs/pers/year), Argentina (40.5 Kgs / pers / year), and Peru (39 Kgs/pers/year), according to the Latin American Association of Aviculturists (La Razón 04/17/2017).

Graphic 18.
Trajectories of the Consumer Price Index (CPI) and the Agricultural Price Index (API)
 (Base 2005 = 100)



Source. Morales JA 2017

Among the products that increased more the average price are the products of direct consumption and of peasant origin⁸², such as onions and lettuce - although there are also some processed products such as coffee and cookies. The price increases varied considerably according to the department and region. For example, the price of onion increased 115% in Tarija and only 21% in Cobija.

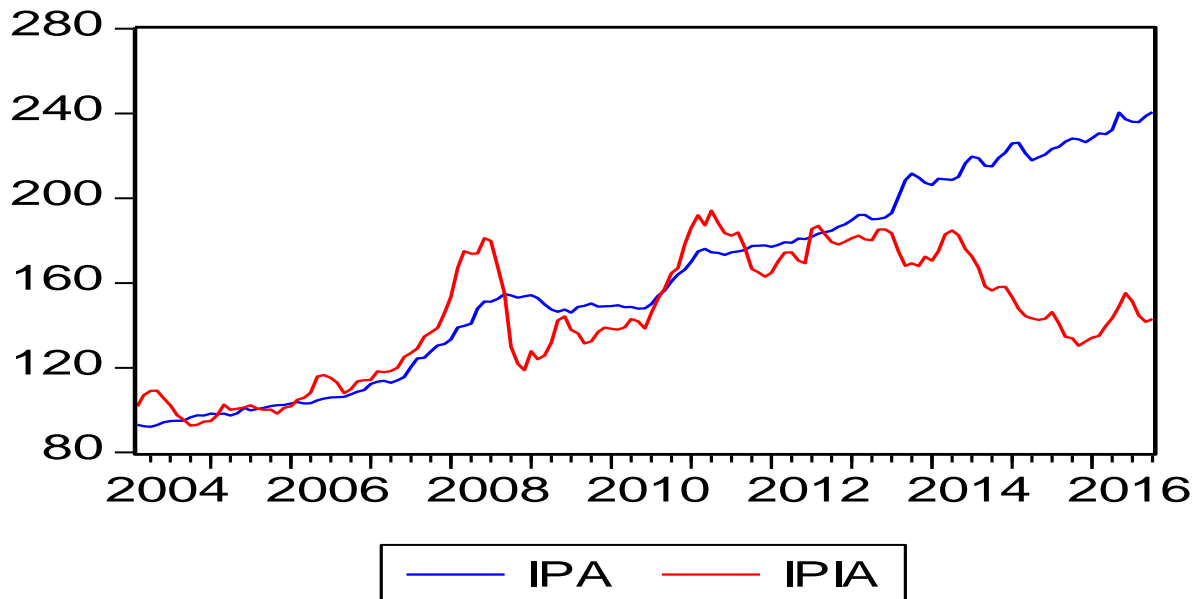
Regarding prices in absolute terms, the highest price increases (also with large variations according to department) occurred in meat (vaccine, flames), milk (powder) and cheese (processed and creole), coincidentally in products of higher energy content.

Previously, we observed that the action of EMAPA in terms of food imports; of the control / regulation of prices of basic foods; of determinations and regulations for exports; of the subsidies; of the direct sales of food and the promotions of the Fairs at Fair Prices, among other measures, have had an effect on keeping prices relatively low and controlled internally, although at an external level or in relation to international prices, a discrepancy with these (see graph No. 19).

It was also observed in the section related to EMAPA, which since 2011 international prices are lower than the prices in force internally, so the Agricultural Price Index (API) at the National level - at least in the case of wheat and flour of wheat - is higher than the International API, this difference being covered by state subsidies. These measures therefore facilitated access (purchases) of the population to basic foods.

⁸² Which invites us to perform an analysis on the terms of rural-urban exchange

Graphic No. 19
Relationship between the IPA and IPIA, (2004-2016) (Base2005 = 100)



REFLECTIONS AND GENERAL CONCLUSIONS

. Unlike the previous governments that proposed to attain food security according to the free market (that is, through the operation of offer and demand and almost no intervention by the State), the government now plays the role of regulator in production processes, distribution and commercialization of the main food products; and incorporates as a theoretical premise the internal production of food, the protection of natural resources, productive diversification, improve eating habits and consumption, among others. It also assumes a new role, much more active, as a planner, regulator, controller and even an economic actor through the constitution of public companies with programs of direct food sales and nutritional support.

- An important part of peasant agriculture (highlands and valleys) is practically excluded from the national productive system, which is reflected in low agricultural productivity, low labor productivity and large differences in land cultivated by worker according to region.

- In the period studied (2005-2015), there is a tendency to increase the cultivated area of agro-industrial export products and a (relative) decrease in the cultivated area of basic food products. There is also a tendency to increase the production of export food, especially based on the expansion of the cultivated area and not on an increase in productive yields, which continue to be the lowest in the Latin American region.

- To support national production as well as to guarantee the diversification and supply of food products in the domestic market at adequate prices and achieve food security with sovereignty, the State has created a series of state food companies, the most representative being EMAPA.

EMAPA, supports the production of 3 basic products (corn, rice and mainly wheat), support that is concentrated mainly in Santa Cruz, and scarcely in the regions of the highlands and valleys.

The support of EMAPA is not significant in terms of productive performance or in the incorporation of new technology to the producer. Neither in the extensions cultivated or in the number of producers, who decide what products to grow each year, depending on the market price.

The support of EMAPA is significant in the stockpiling / purchase and in the processing / transformation, especially of the wheat, as well as in the distribution of the product to the different industries and in the creation of a food reserve.

- In general terms, EMAPA is not only a state company that adventures into the market but has also become the government's operational instrument to implement intervention policies in the food market (temporary regulations such as the application of subsidies, prohibition of exports of certain products that are scarce for domestic procurement, stockpiling and also processing of products, imports of staple foods to supply the population, direct sale of food and others) to prevent increasing prices for speculation and speculation on the part of traders, intermediaries and agribusinesses.

- The State's policies have been developed in two ways. On the one hand, regulating the function of the market and limiting private decisions, and even reinforcing the action of public institutions (EMAPA, LACTEOSBOL) since the market and the private initiative that on several occasions have search to speculate with food goods.

On the other hand, and especially in recent times, has encouraged and completed the action of certain agro-industrial groups of the private sector through government policies that favor them (such as the expansion of the Social Economic Function - SEF, the expansion of the agricultural frontier, the permissibility in the production of transgenic maize, credits with funds from the Pension Funds Associations -PFA, the promotion of the use and import of agrochemicals, among others).

- In short, at the beginning of the period, the State made possible the conformation and better functioning of the food market and the agribusiness sector had to comply with the new rules established by the State. At present, the State is once again joining the liberal market; to that market that determines rules of operation according to their convenience and that responds to interests and private capital.
- In the period studied, the dependence on imports of wheat and wheat flour have decreased compared to previous years. However, there has been an increase in food dependency (with imports of "Prepared Foods" and with imports of several agricultural products produced by peasant family agriculture) compared to the neoliberal period (1985-2005) when imports were temporarily and complementary (in times when there was no national production).
Therefore, attention is drawn to the fact that in a model that promotes Food Security and Sovereignty, imports of all types of food, especially basic foods that the country produces, increase.
- The growth of imports of prepared foods shows, on the one hand, the assimilation and generalization of a globalized diet or consumption of foreign foods that are outsiders to the country's eating habits and reflect a predominantly urban way of life that demands ready-to-eat foods that are marketed in supermarkets and small restaurants that are displacing farmers markets and fairs.
- While national production stagnates in the case of basic consumer products (potato case) or decreases (case of tomato) imports increase significantly to maintain that availability. This also shows that the growth rate of imports of these products is higher than the rate of national production. The national food system cannot continue to be supplied by an ever decreasing domestic production of food and by imports that are increasing more and more.
- Regarding imported seeds, most of these are transgenic for agro industrial and export products, such as soybeans and corn seeds (although the country has sufficient capacity to produce corn and corn seeds throughout the national territory). Therefore, a large part of the import of seeds is to strengthen the export agroindustry and very small for the fortification / expansion of food for domestic consumption.
- Imports of agrochemicals (herbicides, fungicides, insecticides) that were already high in the neoliberal period (1985-2005), have intensified in this period of "Care of Mother Earth" especially by the use of transgenic (soybean) and also in the rest of the products, which also shows that it is intended to prioritize the productive performance based on agrochemicals and based on the expansion of the agricultural frontier rather than natural production and the increase in labor productivity; without considering sustainability or the preservation of productive systems and social systems.

- Agrifood exports continue with the impetus of the previous years, when they diversify and increase in volume, especially those from the agro-industry in the east of the country. In the 10 years analyzed, the group of oilseeds has always represented the first group in terms of the total value exported.
- If exports are considered by regional origin, most of them come from the east of the country, especially the agro-industry, and few from the valleys and highlands, produced by peasant agriculture.
- The growing international demand for certain products - for human consumption as well as for livestock feed or its use in biofuels - has a number of repercussions in the country; in the generated income as well as in the use of agrochemicals, in the opening of the agricultural frontier, in the commercialization system, and in the displacement that they generate in the basic consumption crops of the diet of the national population. In the latter case, the cultivated areas of basic consumer products have been reduced by the cost of growing export products, which has a direct impact on the national supply, which is why imports must be used to satisfy domestic demand, thus losing thus the national food sovereignty.
- The development of intensive livestock farming that is starting in the country opens up more space for fertilizer imports, deforestation and the animal feed industry (which will require more soybeans and transgenic corn not only to export but also to feed the livestock) which will result in the release of abundant amounts of carbon dioxide (due to changes in land use and deforestation), a source of greenhouse gas emissions.
- The process of deforestation is very high in the country, which has increased in recent years due to the expansion of the agricultural frontier for export crops and the expansion of livestock.
- This intensive agricultural system of monocultures that uses high chemical inputs and generates massive deforestation, water scarcity, soil depletion exhaustions and large greenhouse gas emissions, does not offer sustainable agricultural and food production.
- The availability of several foods increased (although products such as legumes and fruits stagnated or decreased), which shows that not only there is more food for the population but that a social differentiation in food consumption is being created. There is a social sector with aspirations of consumption socioculturally determined by international eating patterns and habits and an inefficient national food manufacturing industry that focuses on certain food branches that are part of these patterns, based mainly on imported raw materials. That is to say, an agri-food system based on the external market is being lived.
- In periods of economic crisis such as the one the country experienced between 1982 and 1985 (hyperinflation, external debt, shortages, speculation), the model of food consumption was dependent on the excessive consumption of wheat / wheat flour that increased imports (encouraged for the subsidies of previous years to the mill industry-ADIM- and donations of food).

Today, in the period analyzed (2005-2015) the economic situation of the country is different because it has enjoyed large amounts of economic income due to the high prices of raw materials exported (hydrocarbons, minerals) and because nor high External public debt that presses finances. However, the model of food consumption has increased its dependence, not only on wheat / wheat flour, but more than ever on prepared foods (outsiders to national food habits) and other basic products that the country has the capacity to produce (fruits, tubers among others).

- The case of Prepared Foods shows that it is the result of an urbanized globalization model and the unrestricted opening to imports of all types of products, often unhealthy products (food scrap) that cause obesity and overweight.
So, a transition process is underway that is experiencing the national diet (especially of the middle class that has seen its income increase) and which adds to the existing commercial and communication pressures.
- Although the economic income of the population has increased, they do not correspond to the diversification of national agriculture or to the diversification of the food manufacturing industry; rather, they correspond with the increase in imports, with the increase in the consumption of chickens and fried foods, with the increase in expenses for externally prepared Foods that are not very nutritious and artificial sweetened, with the increase in sales in supermarkets. That is to say, the purchasing power of the population does not correspond to national production but to imports and contraband food.
- In terms of nutrients, the food situation of the country is deficient with respect to the average availability of person / day energy and its degree of adaptation to the necessary requirements. Although the statistics analyzed show an increasing trend throughout the study period (2005-2015), their values are below the estimated energy requirements; below the proteins / person / day and below the fats / person / day. That is to say, in no year the average availability achieved the value of the normative requirements established by the specialized international organisms, however, they are above the established minimum margins, and much higher than in previous years.
- Most of the calorie intake is concentrated in 3 food groups (cereals, dairy products and vegetables) that concentrate a high percentage of total calorie availability. The meats have had a significant increase in the years considered. In parallel, the contribution of proteins from tubers and legumes has decreased, and the protein content of vegetables remains the same. All this shows that in the country there is a strong process of nutritional transition in the 10 years considered.
- Despite the sharp reduction in malnutrition in the country in the period under consideration, the prevalence of chronic malnutrition in children under two years of age continues to be high. Regarding chronic malnutrition, prevalence has been reduced (from 26.4% in 2008 to 18.1% in 2012). In spite of these advances, the problems of malnutrition and anemia still persist, since at the same time they are positioning problems such as overweight and obesity, especially in women and with an upward trend in children due to inadequate dietary consumption. quantity and quality of food and a social culture that is encouraging inappropriate eating habits.
- Progress in reducing extreme poverty and malnutrition in recent years in the country is remarkable, but was not accompanied by an increase in national agricultural production. It is accompanied by an increase in imports and economic subsidies to the main consumer products (wheat-wheat flour).
- What we got used to economic theory (or neoliberal economic models) is that the prices of staple foods are overvalued (especially by subsidizing imported wheat flour and controlling food prices at the retail level) under the foundation that the level of life of the population must be raised and the nutritional level of the poor; while those policies point to a decrease in workers' salary.

Currently, under the current economic model is the opposite. Food prices have been overvalued (subsidizing wheat and wheat flour among others) under the same argument of increasing the standard of living of the population supplemented by an increase in public salaries and an annual increase in the basic salary. The result should have been a greater demand for domestic production but it was not like that, rather the opposite, that

money went to imports. That is to say, the purchasing power did not correspond to the national production either. Production prices were not increased, therefore, domestic production did not increase.

- Finally, it should be noted that it is currently considered to monoproductive agriculture, to commercial export agriculture, to the agriculture of commodities as to "The agriculture", concentrating only on the production of these commodities for the international market, despite being an activity of extraction of productive resources that uses chemical substances (agro-toxic) that systematically poison the land and the environment, the waters and the forests, and that it does not have sustainability
At the same time, it does not adequately support to the other agriculture, which generates consumer goods for the domestic market and for the population; which generates raw materials for the food industry, which conserves the environment, among others.
- As this role has been forgotten and postponed, imports of food and inputs for agriculture and the food manufacturing industry are now playing a substitute role, not only supplying basic consumer products (potatoes, onions, tomatoes, fruits and others) but above all of unhealthy and transformed foods that induce obesity and overweight. This, in part, also explains the low labor productivity in the areas where the majority of the peasant population is located, where the majority of the country's poverty is located.
- As this role has been forgotten and postponed, imports of food and inputs for agriculture and the food industry are now playing a substitute role, not only supplying basic consumer products (potatoes, onions, tomatoes, fruits and others) but above all of unhealthy and transformed foods that induce obesity and overweight. This, in part, also explains the low labor productivity in the areas where the majority of the peasant population is located, where the majority of the country's poverty is located.
- In recent years, the agro-export model that was already valid in the neoliberal period (1985-2005) it has redoubled; an extractivist model that promotes the indiscriminate exploitation of productive resources and monocultures, which have added to the intercultural farmers, without greater economic or environmental sustainability, dismantling the agroproductive systems and the structures and roles of the social systems of the peasants, inculcating an inadequate feeding / nutrition and transforming national dietary habits.

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ANNEXES

Table No. 1 Agricultural Production (Tm)

DESCRIPTION	2005-2006	2008-2009	2011-2012(p)	2013-2014(p)	2014-2015(p)
TOTAL	12.141.881	15.220.055	15.422.732	16.449.421	17.240.340
CEREALS	1.991.322	2.371.751	2.334.646	2.457.083	3.004.225
Rough Rice	531.969	410.994	588.706	377.643	473.486
Barley Green	51.671	47.608	46.503	47.875	50.180
Corn in grain (*)	930.952	1.174.447	1.108.381	1.034.718	1.255.030
Quínua	27.739	34.156	50.566	83.603	89.754
Sorghum in grane (*)	310.546	503.038	394.626	695.840	770.824
Wheat (*)	138.445	201.508	145.862	217.404	364.951
STIMULANTS	29.907	32.917	20.010	27.072	21.235
Cacao	3.793	4.510	5.886	5.279	5.272
Coffee	26.114	28.407	14.123	21.793	15.963
FRUIT	856.836	880.637	999.131	995.410	1.005.331
Banana	150.517	154.227	254.187	218.217	242.320
Peach	30.950	32.811	34.450	39.389	43.927
Tangerine	103.414	127.337	131.932	135.663	146.247
Orange	150.617	165.397	171.222	186.867	182.458
Pineapple	49.394	48.074	59.991	50.020	55.868
Banana	346.823	328.495	311.450	334.606	304.317
Grape	25.121	24.296	35.899	30.648	30.194
VEGETABLES	256.117	279.405	307.622	357.762	353.109
Garlic	6.223	7.420	7.107	7.171	5.766
Vetch	21.964	22.194	20.072	23.005	32.203
Onion	61.789	78.585	91.288	83.391	95.608
Bean (*)	32.587	38.522	59.938	107.646	78.461
Broad bean	54.685	57.419	56.965	61.419	58.370
Corn Choclo	21.855	22.195	20.504	21.279	21.341
Tomato	57.014	53.070	51.748	53.851	61.360
OLEAGINOUS & INDUSTRIALS	7.554.699	10.120.298	10.229.084	11.087.526	11.325.629
Cotton	4.049	1.357	4.416	2.012	1.989
Sugar Cane	5.786.076	7.803.800	7.602.558	7.833.098	8.394.854
Sunflowe (*)	120.300	394.207	181.398	207.503	96.951
Peanut	13.046	13.315	16.538	20.788	22.153
Sésame	22.500	15.000	13.024	10.134	9.263
Soy(*)	1.608.728	1.892.619	2.411.150	3.013.991	2.800.419
TUBERS AND ROOTS	1.142.474	1.205.808	1.246.101	1.186.845	1.216.032
Potato	859.676	956.953	974.030	941.705	992.728
Yuca	282.798	248.855	272.071	245.140	223.304
FORAGE	310.526	329.239	286.131	337.723	314.779
Alfalfa	170.008	190.252	137.843	191.057	174.062
Barley berza	140.518	138.987	148.288	146.666	140.717

Source. INE; MDRyT; National Agriculture survey 2008 (*) Includes winter campaign from previous year

Table No. 2 Cultivated Surface (Has)

DESCRIPTION	2005-2006	2008-2009	2011-2012(p)	2013-2014	2014-2015
TOTAL	2.627.676	2.974.627	3.215.963	3.499.133	3.729.373
CEREALS	885.474	1.006.058	1.093.639	1.204.074	1.369.887
Rough Rice	205.178	186.804	183.854	146.466	169.591
Barley Grain	62.528	55.943	52.832	53.051	57.319
Corn in grain (*)	350.979	416.685	408.204	390.618	490.088
Quínua	46.316	59.924	96.544	159.549	181.529
Sorghum in grane (*)	95.033	130.032	192.883	266.619	261.001
Wheat (*)	125.440	156.670	159.322	187.771	210.359
STIMULANTS	35.060	38.851	46.262	47.990	53.543
Cacao	7.153	8.471	10.157	10.648	11.424
Coffee	27.907	30.380	36.105	37.342	42.119
FRUIT	99.359	106.765	112.283	113.549	122.160
Banana	16.375	17.114	18.036	18.279	20.533
Peach	5.283	5.854	6.048	6.164	7.654
Tangerine	11.972	16.118	16.482	16.805	18.931
Orange	21.796	23.974	25.619	25.542	25.722
Pineapple	4.142	4.015	4.092	4.108	4.535
Banana	35.767	35.555	37.650	38.129	40.528
Grape	4.024	4.135	4.357	4.522	4.257
VEGETABLES	96.736	102.662	124.113	158.879	151.897
Garlic	1.353	1.576	1.496	1.508	1.375
Vetch	14.446	15.006	14.753	15.005	16.906
Onion	8.119	9.177	9.572	9.598	10.241
Bean (*)	27.711	29.821	50.444	83.476	73.843
Broad bean	32.173	34.287	35.242	36.648	36.201
Corn Choclo	7.547	7.614	7.579	7.504	7.579
Tomato	5.387	5.181	5.027	5.140	5.752
OLEAGINOUS & INDUSTRIAL	1.226.962	1.409.509	1.518.509	1.644.984	1.683.797
Cotton	7.524	2.459	8.000	2.989	3.115
Sugar Cane	115.511	156.115	148.334	162.759	162.218
Sunflowe (*)	99.350	311.060	220.773	203.700	98.060
Peanut	11.794	12.657	12.871	13.571	16.092
Sesame	45.000	25.000	25.142	18.647	17.829
Soybean(*)	947.783	902.218	1.103.389	1.243.318	1.386.483
TUBERS AND ROOTS	191.817	211.736	222.048	228.048	244.366
Potato	161.014	182.942	192.989	198.336	213.546
Yuca	30.803	28.794	29.058	29.712	30.820
FORAGE	92.268	99.046	99.110	101.609	103.723
Alfalfa	26.662	30.553	30.161	31.637	37.323

Barley berza	65.606	68.493	68.949	69.972	66.400
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Source. INE; MDRyT; Encuesta Nacl. Agriculture Survey 2008.

(*) Includes Winter campaign from previous year

Table No. 3
Labor productivity by department (2005-2015)

Years	Apparent Productivity of work (Total produccion/ PEAA) (TM/PEAA)	Cultivated land per worker (Total area /PEAA)(Has/PEAA)	Average yield of land (Tm/Ha)
2005			
La Paz	1,67	0.54	3.09
Cochabamba	2,44	0.56	4.32
Santa Cruz	58,06	11.25	5.16
Oruro	2.16	0.97	2.23
Potosí	1,01	0.48	2.09
Chuquisaca	1,46	0.72	2.02
Tarija	10.11	1.09	9.27
Beni	7,14	1.74	4.10
Pando	8,25	1.64	5.03
2008			
La Paz	1.66	0.55	3.00
Cochabamba	2.69	0.60	4.48
Santa Cruz	75.54	13.05	5.78
Oruro	2.35	1.13	2.08
Potosí	0.95	0.49	1.94
Chuquisaca	1.50	0.72	2.07
Tarija	10.47	1.04	10.02
Beni	5.75	1.07	5.37
Pando	7.17	1.43	5.01
2011			
La Paz	2.08	0.71	2.91
Cochabamba	3.37	0.76	4.44
Santa Cruz	91.21	17.26	5.28
Oruro	2.96	1.77	1.67
Potosí	1.25	0.71	1.77
Chuquisaca	2.66	0.93	2.85
Tarija	15.28	1.48	10.33
Beni	7.39	1.43	5.14
Pando	10.10	1.87	5.39
2013			
La Paz	1.75	0.66	2.62
Cochabamba	3.03	0.63	4.78
Santa Cruz	84.72	16.10	5.26
Oruro	2.31	1.65	1.40
Potosí	1.20	0.77	1.55
Chuquisaca	3.77	1.27	2.97
Tarija	11.64	1.18	9.86
Beni	11.05	2.16	5.11
Pando	8.85	1.68	5.24
2015			
La Paz	1.56	0.61	2.54
Cochabamba	2.70	0.57	4.68

Santa Cruz	76.33	14.57	5.24
Oruro	2.04	1.55	1.32
Potosí	1.11	0.73	1.51
Chuquisaca	2.77	1.04	2.64
Tarija	11.42	1.32	8.63
Beni	9.04	2.13	4.24
Pando	7.33	1.49	4.90

Source: Built by the author based on data from the INE and the MDRyT.

Table 4 a. Food Manufacturing production

	2006	2007	2010	2013
A. Number of employed persons	20.749	20.945	26.102	s.d
Milling and bakery products	2.113	2.200	4.094	s.d
Sugar and y confectionery	2.283	2.486	3.067	s.d
Miscellaneous Food products	6.069	5.660	7.114	s.d
Beverages	4.755	4.815	4.576	s.d
Fresh and processed meats	3.118	3.239	4.013	s.d
Dairy Products	2.411	2.545	3.238	s.d
B. Value added (millions Bs.)	4.824	5.837	6.929	10.529,60
Milling and Bakery products	305,75	556,49	455,79	708,69
Sugar and y confectionery	642,86	611,54	687,22	428,36
Miscellaneous Food Products	948,13	1.155,79	1.749,51	4.247,01
Beverages	1.281,46	1.572,47	2.187,87	3.372,50
Fresh and processed meats	1.138,45	1.136,02	1.157,86	181,67
Dairy Products	507,79	805,03	690,42	1.591,35
C. VBP of Foods	12.828	14.837	18.711	27.062,79
Milling and bakery products	1.099,31	1.641,73	1.464,78	2.029,68
Sugar and y confectionery	1.383,45	1.395,77	1.738,98	2.017,62
Miscellaneous Food Products	4.034,39	4.859,27	6.825,59	13.530,72
Beverages	2.238,30	2.659,19	3.933,61	6.626,26
Fresh and processed meats	2.636,06	2.567,74	2.949,00	459,25

Dairy Products	1.436,97	1.713,34	1.798,69	2.399,24
D. Productivity (=B/A)	23%	28%	27%	s.d
Milling and bakery products	14%	25%	11%	s.d
Sugar and y confectionery	28%	25%	22%	s.d
Miscellaneous Food Products	16%	20%	25%	s.d

Source: INE-EAIM, Elaboration UDAPRO (Obtained from the Integrated System of Productive Information)

Table No. 4 b.
Import of food industry supplies (2012) (thousands of Bs.)

	VBP	Import of supplies	%
Dairy products	2.285.378	218.151	9.54
Milling and bakery products	6.810.866	939.343	13.79
Sugar and y confectionery	2.413.044	421.825	17.48
Miscellaneous Food Products	10.304.625	1.120.766	10.87
Beverages	8.901.296	1.484.064	16.67

Source: National Institute of Statistics (INE) Matrix Supplie Product 2012-MIP

Table No. 5 Food Imports (Tm y \$us)

Group of Products	2005		2006		2008		2011		2013		2014		2015	
	Tm	\$us	Tm	\$us	Tm	\$us	Tm	\$us	Tm	\$us	TM	\$us	TM	\$us
1. Meats	1.111	1.128	2.061	1.112	1.621	1.278	2.051	3.654	3.995	5.751	5.306	7.327	7.804	9.141
2. Cereals	405.965	79.624	348.724	81.523	445.752	215.054	450.487	202.467	402.609	222.971	579.955	300.779	357.052	182.104
2.1. Wheat	209.184	24.081	130.830	18.154	88.880	25.908	80.375	23.290	145.243	48.617	220.166	73.193	6.245	1.535
2.2. Corn	2.628	3.609	2.065	2.830	15.684	8.048	86.158	33.325	3.044	9.331	4.881	10.987	4.727	12.742
2.3. Rice	3.386	890	2.011	513	43.998	22.422	4.852	2.184	36.617	19.859	79.595	39.658	40.473	16.340
3. Cereal Derivatives	189.197	49.155	212.408	57.993	296.037	157.234	273.028	138.090	214.820	137.823	271.937	169.716	303.144	146.735
3.1. H. of wheat	135.373	25.827	157.361	33.257	235.271	115.842	193.680	77.228	86.834	42.256	144.862	70.801	215.259	72.511
3.2. Preparations of cereals	17.253	10.112	20.135	11.369	15.852	17.173	32.920	31.918	84.298	62.808	78.771	60.890	44.668	41.429
4. Dairy products/eggs	13.098	16.471	9.086	11.767	6.974	11.050	9.392	17.826	11.559	24.644	11.810	26.427	12.531	25.760
4.1. Milk	12.458	14.852	8.395	9.956	6.486	8.897	8.517	13.407	10.292	17.416	10.614	18.376	11.411	18.131
4.2. Cheese	619	1.474	659	1.554	439	1.632	517	2.159	837	3.712	774	3.560	790	3.684
5. Tubers and roots	2.969	309	2.043	272	23.475	1.509	22.996	1.723	25.634	1.728	33.668	2.417	28.669	2.098
5.1. Potatoes	2.809	77	1.899	73	23.354	828	22.445	750	24.488	883	31.251	1.162	25.530	956
6. Sugar and others	8.940	2.059	8.884	3.358	3.078	1.809	96.419	75.364	4.318	3.501	4.388	4.557	9.082	5.624
7. Vegetables	3.790	1.374	2.166	544	597	99	1.979	491	4.417	646	6.316	950	8.182	984
7.1. Tomatoes	354	24	467	44	304	33	873	33	2.424	225	3.388	309	5.842	531
8. Legumes/pulses	3.905	2.229	5.354	2.649	5.272	4.440	9.736	6.213	15.515	9.509	18.119	9.685	26.413	11.392
9. Oleaginous and industrial derivatives	140.129	28.821	213.508	41.858	63.045	29.068	16.597	15.221	17.625	20.275	16.833	17.869	22.549	20.905
10. Fruits, preserves and derivatives	27.621	7.523	27.044	7.547	33.762	13.341	46.266	20.114	55.642	27.171	52.109	25.727	64.708	30.412
11. Stimulants y cacao	7.927	10.433	8.254	13.084	12.729	25.450	13.271	35.555	12.775	40.081	14.785	45.444	15.766	43.782
12. Fish, molluscs	8.047	3.079	8.003	4.493	11.040	9.511	12.448	16.852	12.360	16.951	13.620	17.729	15.577	20.359
13. Preparations, soups, etc	22.441	39.982	42.303	48.289	43.787	80.481	40.567	122.465	43.973	165.944	58.000	173.529	48.889	161.946
1.4.Others (pepper species, palmetto, chia)	764	782	706	606	938	680	845	730	1.170	1.178	913	1.536	608	1.236
Total	835.904	242.970	890.546	275.095	948.107	551.003	996.080	656.766	826.410	678.172	1.087.760	803.694	920.975	662.478

Source FUENTE: National Institute of Statistics

Table 6 Food Smuggling (in thousand US \$) (2007-2010)

Products/Years	2007	2010
Agricultural Products	32.000	19.125
Cereals	653	969
Wheat	653	969
Legums and Vegetables	1.563	2.083
Tubers	22.109	12.936
Fruits	7.559	1.923
Spices	116	1.214
Fresh and processed meats	11.915	13.551
Dairy products	322	357
Processed milk	208	217
Processed cheeses and butters	87	126
Fermented milk or yogurt	27	14
Products of milling, bakery and beneficiary	77.885	68.253
Wheat flour and derivatives	45.882	62.472
Bakery and Pasta products	1.201	5.781
Benefited from rice	30.802	s.d.
Sugar and molasses	2.871	252
Refined edible oils	1.942	1.212
Miscelaneous food products	11.693	10.440
Preparation of balanced meal	1.598	244
Cacao and confectionery products	4.850	2.945
Processing of others food products	5.245	7.251
Forestry, fishing and hunting products roductos de la silvicultura, pesca y caza	1.590	140
Total (thousand \$us)	140.218	113.330

Source: "Estimates of contraband " Study prepared by the INE.

Table No. 7 Food Exports (Tm and thousand \$us)

Group of Products	2005		2006		2008		2011		2013		2014		2015	
	Tm	\$us	Tm	\$us	Tm	\$us	Tm	\$us	Tm	\$us	TM	\$us	TM	\$us
1. Meats	1.195	2.513	2.713	4.146	2.116	3.454	2.064	4.637	5.020	16.209	4.618	17.719	4.303	16.844
2. Cereals	15.938	9.027	57.927	17.165	38.565	32.408	27.999	75.279	97.935	190.021	51.344	223.507	156.249	151.304
2.1. Corn	4.307	699	25.294	3.203	10.519	2.627	1.451	865	29.811	11.940	7.863	6.169	103.029	24.945
2.2. Quinoa	4.826	5.573	7.645	8.911	10.311	23.028	20.180	63.446	34.746	153.259	29.505	196.637	25.102	107.706
2.3. Rice	1.056	311	8.200	1.662	54	8	1.513	803	1.875	1.160	0	0	1.007	143
3. cereal derivatives	5.091	2.016	6.121	2.002	5.097	4.022	4.763	9.923	6.657	18.313	6.436	18.676	5.646	14.571
3.1. Wheat flour	1.202	356	1.970	589	0	0	0	0	0	0	0	0	0	0
3.2. Preparation of cereals	2.940	1.160	1.667	701	2.242	1.836	3.537	6.246	4.569	8.859	5.020	9.385	4.355	8.909
4. Dairy products / eggs	2.395	5.319	4.552	10.358	1.272	4.590	3.186	11.666	12.646	38.649	19.541	48.032	16.219	32.335
4.1. Milk	2.251	5.183	4.505	10.338	1.271	4.588	3.186	11.666	12.646	38.649	19.541	48.032	16.218	32.324
5. Tubers and Roots	5	35	19.793	535	85.451	2.007	42	92	35	98	936	2.588	135	304
5.1. Potatoes	1	16	2	29	3	40	3	48	5	65	7	85	6	69
6. sugars and others	66.815	19.984	43.183	18.459	146.480	49.776	864	884	160.064	82.618	19.084	10.303	1.035	1.117
7. Vegetables	21.053	9.321	24.035	10.332	35.388	42.648	31.837	29.038	39.559	43.493	29.136	27.987	23.511	21.587
8. Legums/ pulses	842	508	826	554	381	770	217	686	44	89	80	150	126	199
9. Oleaginous and industrial derivatives	496.929	204.800	449.551	208.528	429.495	392.007	375.151	395.247	1.098.056	750.150	712.799	540.364	533.760	388.153
9.1 Soy bean : a) grain, flour, cake	146.479	33.390	70.222	15.216	92.507	39.697	31.896	15.395	593.399	268.253	183.636	89.784	6.843	3.305
b) soy bean oil	215.739	114.344	227.484	120.952	148.775	173.246	219.067	262.672	313.526	287.887	367.242	293.032	386.899	256.108
9.2. a) Sunflower sedes	452	553	210	406	31.248	15.140	871	1.794	11.949	5.484	1.450	2.046	870	911
b) Sunflower oil	29.044	18.793	54.237	35.755	88.692	116.709	51.220	63.461	73.515	78.234	57.349	55.845	41.368	39.592
9.3 Sésame (Seeds)	21.774	16.579	14.487	13.736	4.659	11.360	8.848	15.247	6.279	13.523	5.440	13.018	5.024	8.675
10. Fruits, preserves and derivatives	77.205	89.411	104.816	88.463	115.470	111.325	137.267	185.963	138.396	178.681	153.433	231.679	163.148	253.547
10.1. bananas	53.757	7.412	77.792	10.061	88.270	12.061	108.121	22.381	107.767	30.249	115.807	35.740	123.860	38.088
10.2. Nuts	16.533	75.438	18.578	70.384	19.899	88.221	18.677	148.531	20.198	129.536	25.523	175.543	24.626	192.148
11. Stimulants and cacao	5.545	12.904	6.226	15.984	4.832	17.349	5.268	29.256	4.054	17.669	3.796	18.001	2.174	12.748
11.1. Coffee	5.053	11.291	5.646	14.207	4.407	15.030	4.569	26.264	3.625	15.587	3.571	16.594	1.821	10.189
11.2. Cacao	470	1.459	570	1.675	415	2.162	686	2.786	423	1.955	218	1.269	342	2.415
12. Prepared soups , etc	157	356	375	636	767	818	1.029	2.183	912	3.254	1.044	5.159	1.402	6.513
13. Others (species, pepper, hearth of pal, chia)	253	346	428	597	204	509	535	1.285	504	1.150	298	490	237	348
TOTAL	1.199.306	649.097	1.239.055	685.583	1.368.793	1.167.435	1.064.047	1.387.740	2.778.215	2.385.036	1.824.719	2.087.836	1.649.318	1.625.097

Source National Statistics Institute

Products exported 2005-2015 (In TM and \$us)(Summary)

Group of products exported	2005		2008		2011		2013		2015	
	Tm	\$us	Tm	\$us	Tm	\$us	Tm	\$us	TM	\$us
1.Meats	1.195	2.513	2.116	3.454	2.064	4.637	5.020	16.209	4.303	16.844
2. Cereals	15.938	9.027	38.565	32.408	27.999	75.279	97.935	190.021	156.249	151.304
3. Cereal derivatives	5.091	2.016	5.097	4.022	4.763	9.923	6.657	18.313	5.646	14.571
4. Dairy products/eggs	2.395	5.319	1.272	4.590	3.186	11.666	12.646	38.649	16.219	32.335
5. Tubers and Roots	5	35	85.451	2.007	42	92	35	98	135	304
6. Sugars and others	66.815	19.984	146.480	49.776	864	884	160.064	82.618	1.035	1.117
7.Vegetables	21.053	9.321	35.388	42.648	31.837	29.038	39.559	43.493	23.511	21.587
8. Legums/ pulses	842	508	381	770	217	686	44	89	126	199
9. Oleaginous and industrial derivatives	496.929	204.800	429.495	392.007	375.151	395.247	1.098.056	750.150	533.760	388.153
10. Fruits, preservatives and derivatives	77.205	89.411	115.470	111.325	137.267	185.963	138.396	178.681	163.148	253.547
11. Stimulants and cacao	5.545	12.904	4.832	17.349	5.268	29.256	4.054	17.669	2.174	12.748
12.Prepared, soups , etc	157	356	767	818	1.029	2.183	912	3.254	1.402	6.513
13. Others (species, pepper, hearts of pal,m chia)	253	346	204	509	535	1.285	504	1.150	237	348
TOTAL	1.199.306	649.097	1.368.793	1.167.435	1.064.047	1.387.740	2.778.215	2.385.036	1.649.318	1.625.097

Source: National Statistics Institute

Table No. 8 Balance sheet of food (2005-2015)(In thousand of Tm)

No	Product Groups	2005				2008				2011				2013				2015			
		P	M	X	C	P	M	X	C	P	M	X	C	P	M	X	C	P	M	X	C
1	Meats	275,18	1,11	1,19	275,09	296,95	1,62	2,12	296,46	322,40	2,05	2,06	322,39	343,16	3,99	5,02	342,13	345,75	7,80	4,30	349,25
2	Cereals	1.991,32	405,97	15,94	2.381,35	2.371,75	445,75	38,57	2.778,94	2.334,65	450,49	28,00	2.757,13	2.457,08	402,61	97,93	2.761,76	3.004,23	357,05	156,25	3.205,03
2.1	Wheat	138,45	209,18	0,09	347,54	201,51	88,88	0,00	290,39	249,67	80,38	0,00	330,04	217,40	145,24	0,00	362,65	364,95	6,24	0,00	371,20
2.2	Corn	930,95	2,63	4,31	929,27	1.000,39	15,68	10,52	1.005,55	1.108,38	86,16	1,45	1.193,09	1.034,72	3,04	29,81	1.007,95	1.255,03	4,73	103,03	1.156,73
2.3	Quinoa	27,74	0,00	4,83	22,91	34,16	0,00	10,31	23,85	50,57	0,00	20,18	30,39	83,60	0,00	34,75	48,86	89,75	0,00	25,10	64,65
2.4	Rice	531,97	3,39	1,06	534,30	410,99	44,00	0,05	454,94	588,71	4,85	1,51	592,05	377,64	36,62	1,87	412,38	473,49	40,47	1,01	512,95
3	Cereal Derivatives	171817	189,20	5,09	355923	93089	296,04	5,10	384028	168695	273,03	4,76	436959	214754	214,82	6,66	422918		303,14	5,65	297498
3.1	Wheat Flour	125.447	135,37	1,20	259619	66403	235,27	0,00	301674	141694	193,68	0,00	335374	179488	86,83	0,00	266322		215,26	0,00	215259
3.2	Wheat cereal preparations	46.370	17,25	2,94	60683	26686	15,85	2,24	40296	27001	32,92	3,54	56385	35266	84,30	4,57	114995		44,67	4,36	40313
4	Dairy milk	361759	13098	2395	372462	387431	6,97	1,27	393133	485186	9,39	3,19	491392	570213	11,56	12,65	569125	595515	12,53	16,22	591827
4.1	Milk	354,15	12,46	2,25	364,35	378,77	6,49	1,27	383,99	473,86	8,52	3,19	479,19	558,56	10,29	12,65	556,21	595,52	11,41	16,22	590,71
4.2	Cheeses	7,61	0,62	0,00	8,23	8,66	0,44	0,00	9,10	11,32	0,52	0,00	11,84	11,65	0,84	0,00	12,49	0,00	0,79	0,00	0,79
5	Tuercs and roots	1.142,47	2,97	0,00	1.145,44	1.205,81	23,48	85,45	1.143,83	1.246,10	23,00	0,04	1.269,06	1.186,85	25,63	0,04	1.212,44	1.216,03	28,67	0,13	1.244,57
5.1	Potatoes	859,68	2,81	0,00	862,48	956,95	23,35	0,00	980,30	974,03	22,44	0,00	996,47	941,71	24,49	0,00	966,19	992,73	25,53	0,01	1.018,25
6	Sugars and others	402,99	8,94	66,81	345,11	509,36	3,08	146,48	365,95	449,67	96,42	0,86	545,23	499,43	4,32	160,06	343,68	433,21	9,08	1,04	441,26
7	Vegetables	256,12	3,79	21,05	238,85	279,41	0,60	35,39	244,61	307,62	1,98	31,84	277,76	357,76	4,42	39,56	322,62	353,11	8,18	23,51	337,78
7.1	Tomatoes	57,01	0,35	0,00	57,37	53,07	0,30	0,00	53,37	49,48	0,87	0,00	50,35	53,85	2,42	0,00	56,27	61,36	5,84	0,00	67,20
8	Legums/ pulses	310,53	3,91	0,84	313,59	329,24	5,27	0,38	334,13	286,13	9,74	0,22	295,65	337,72	15,52	0,04	353,19	314,78	26,41	0,13	341,07
9	Oleaginous industrial derivatives	7.554,70	139,53	496929	7197297	10.120.298	61,82	429.495	9.752.622	10.229,08	15,16	375151	9.869.092	11.087,53	13,20	1.098.056	10.002.667	11.325,63	13,55	533760	10.805.417
10	Fruits, preserves and derivatives	856,84	27,62	77,20	807,25	880,64	33,76	115,47	798,93	999,13	46,27	137,27	908,13	995,41	55,64	138,40	912,66	1.005,33	64,71	163,15	906,89

11	Stimulants and cacao	29,91	7,93	5,55	32,29	32,92	12,73	4,83	40,81	20,01	13,27	5,27	28,01	27,07	12,77	4,05	35,79	21,24	15,77	2,17	34,83
12	Fish and molluscs		8,05	0,00	8,05		11,04	0,03	11,01		12,45	0,00	12,45		12,36	0,00	12,36		15,58	0,00	15,58
13	Prepared. Soups, etc.		22,44	0,16	22,28		43,79	0,77	43,02		40,57	1,03	39,54		43,97	0,91	43,06		48,89	1,40	47,49
14	Others		0,76	0,25	0,51		0,94	0,20	0,73		0,84	0,54	0,31		1,17	0,50	0,67		0,61	0,24	0,37
	Total																				
	Fuente: Construido por el autor en base a datos del INE, UDAPRO y MDRyT																				

= Production

M = Imports

X = Exports

C = Consumption (resulting from P + M-X)

1. Meats (fresh and frozen) = bovine, ovine, porcine, offal, bacon, meat extracts, sausages

2. Cereals comprised = rice, sorghum (grain), barley (grain), wheat, corn, quinoa

3. Cereal derivatives = wheat flour

4. Dairy products / eggs = cheeses, yogurts, butters, eggs, etc.

5. Tubers and roots = potatoes, cassava, roots

6. Sugars and others

7. Vegetables and vegetables = garlic, onion, broccoli, cauliflower, spinach, carrot, cabbage (brussels), tomato.

8. Legumes / legumes = beans, lentils, chickpeas, beans, peas (= peas), alfalfa, beans, corn (Choclo)

9. Oilseeds and industrial derivatives = (cotton but not place it as it is not food), sunflower, peanuts, sesame and derivatives, soy and derivatives

10. Fruits, preserves and derivatives = banana, peach, tangerine, orange, pineapple, banana, grape, chestnut

11. Stimulants and cocoa (cocoa, coffee, tea, mate (no coca!))

12. Fish and molluscs

13. Preparations, soups and others

14. Others (palmito, chía)

Table No. 9 Total production according to type of producer and origin (Tm)

Product	Origin	Type of producer	2005	2008	2011	2013	2015
Rice	High Plateau/Valley	Small Farmer	46.034	48.529	52.634	56.704	55.284
	Tropic	Small	485.935	362.465	536.073	320.939	418.202
		Total					
Corn	High Plateau/Valley	Small	251.443	246.070	387.192	350.598	348.952
	Tropic	Medium/Big	679.509	928.377	721.190	684.120	906.078
		Total					
Wheat	High Plateau/Valley	Small/Medium	56.512	60.194	76.842	86.666	95.692
	Tropic	Small/Med/Big	81.933	141.314	69.020	130.738	269.259
		Total					
Quinoa	High Plateau/Valley	Small/Medium	27.739	34.156	50.566	83.603	89.754
	Tropic		-	-	-	-	-
Cacao	High Plateau/Valley	Small	2.857	3.474	4.682	4.204	4.482
	Tropic	Small	936	1.036	1.204	1.075	790
		Total					
Coffee	High Plateau/Valley	Small	25.448	27.729	13.805	21.182	15.462
	Tropic	Small/Medium	666	678	319	611	501
		Total					
Pea	High Plateau/Valley	Small	20.807	20.980	18.968	21.894	22.627
	Tropic	Small	1.157	1.214	1.104	1.111	9.576
		Total					
Onion	High Plateau/Valley	Small	56.487	1.782	84.680	76.723	84.255
	Tropic	Small	5.302	6.803	6.607	6.668	11.353
		Total					
Bean	High Plateau/Valley	Small	3.159	4.571	6.240	5.749	10.114

	Tropic	Small	29.428	33.951	53.698	101.897	68.347
		Total					
Broad Bean	High Plateau /Valley	Small	54.599	57.331	56.884	61.342	57.786
	Tropic	Small	86	88	80	77	584
		Total					
Corn choclo	High plateau/Valley	Small	10.278	6.500	5.252	6.272	6.385
	Tropic	Small	11.577	15.695	15.253	15.007	14.956
		Total					
Tomatoe	High Plateau /Valley	Small	23.885	32.106	31.141	34.080	35.996
	Tropic	Small	33.129	20.964	20.608	19.771	25.364
		Total					
Potato	High Plateau /Valley	Small	804.129	901.786	920.184	868.318	916.125
	Tropic	Small	55.547	55.167	53.845	73.387	76.603
		Total					
Yuca	High Plateau /Valley	Small	78.624	75.484	111.650	76.562	65.139
	Tropic	Small	204.174	173.371	160.422	168.578	158.165
		Total					
Sugar Cane	High Plateau /Valley	Medium	631.153	681.181	728.970	629.843	655.507
	Tropic	Big	5.154.923	7.122.619	6.873.588	7.203.255	7.739.347
		Total					
Peanut	High Plateau /Valles	Small	8.994	9.273	13.025	17.302	16.604
	Tropic	Small	4.052	4.042	3.513	3.486	5.549
		Total					
Soybean	Tropic	Medium/Big	1.608.728	1.892.619	2.411.150	3.013.991	2.800.419

High Plateau / Valleys = La Paz, Oruro, Potosí, Cochabamba, Chuquisaca, Tarija

Tropic = Santa Cruz, Beni, Pando

Small Producer = between 0 and 50 Has; medium between 51 and 200 hectares; and large producer between 201 and more Has.

Source.- Built by the author based on data from the MDRyT; and Prudencio J. 2009