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# Livestock


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## INTRODUCTION

The world population increase, the change in consumption habits, the loss of biodiversity, and global warming make up a series of global and urgent challenges, which are different but interconnected. The analysis of these problems requires the consideration of physical, biochemical and social phenomena that interact at different scales in an intricate way. With this background and a perspective of sustainable development, our objective is to generate knowledge that makes it possible to understand and communicate the conditions, the possible forms and the consequences of livestock ecological intensification, and its interaction with the territories in which it is based. From a scientific viewpoint, our contribution refers to the interactions between 'livestock and territory' in relation to 'ecological intensification' (Bonmarco 2013) taking into account the challenges of "sustainable development".

The contribution of Uruguay (Figure 1) to this ebook was of particular interest, given the inescapable importance of the country's livestock activity, the characteristics of its ecological conditions, its internal organization and its international insertion. Livestock activity provided more than 80% of the exports throughout most Uruguay's existence and even earlier. With four cattle head per inhabitant, it is the country with the largest livestock activity in the world. This chapter relates specifically to the agricultural sector evolution in general and that of livestock in particular in Uruguay since the end of the 1960s, proposing for its analysis three major stages: i) 1960–1980, "more of the same but differently" describes a period where there is a gradual awareness that livestock is unable to promote a satisfactory development for the whole country; ii) 1980–2000, "new activities are consolidated", especially the plantation of eucalyptuses and pines, livestock gradually makes room for other activities; and iii) 2002 onward, "globalization is imposed" with the material and political progress of international / global entities, i.e. corporations and environment, or family farming concerns. To carry out this work, a bibliographic brief review and a series of interviews and workshops with diverse stakeholders were taken into account.

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*Figure 1: Map of Uruguay*

## BEFORE THE 1960S

In Uruguay, the cattle population grew before the settlement of European conquerors, and from very early on it has been a source of products for remote destinations, in an evolution that was ruled by the industrial revolution. Following the Jesuits' expulsion in 1764 (Morales, 2012) the model of private land ownership intensified with the appropriation of its products, and was fully consolidated 100 years later.

Toward the beginning of the 20th century, the traditional view in Uruguay – as in many other Latin American countries – was that extensive livestock farming was an archaic and residual activity, which should be replaced by agriculture as an inescapable expression of progress. This led to a somewhat enthusiastic development of agrarian sciences and a territorial organization model of small owners, who lived and worked with their families on the farms, as the ideal of a territorial, economic, social and political organization. Unlike the territorial expansion on non-colonized areas that occurred in Argentina, Australia or North America, Uruguay's agricultural frontier has been reached very early. Therefore, the effort focused on promoting the dominant 'ideal type', associated with the political movement locally known as *batllismo*, in the face of an organization resulting from the agrarian structure developed during the colonial period and the 19th century.

One of the earliest expressions of that effort was the Colonia Lavalleja formation in 1862 (Montes, 2010), of the same model applied at other latitudes at the same moment. It consisted in the settlement of dozens of families in an area near the Northern border that had to be protected and secured.

In the early 20th century, the formation of Rural Development Societies was encouraged (one was founded in each railway station). They were organized at national level in 1915 with the creation of the National Commission for Rural Promotion, which has been since associated with that ideal of more or less collective working families settled in small-scale farms carrying out intensive farming without resorting to hiring employees.

In 1921 (INC, 2014), the Department of Colonias in the Mortgage Bank was formed with a mission stating that "Every *colono* is required to inhabit the adjudicated farm and work the land for himself", which constitutes a direct antecedent to the regulation defining family farming that took place 88 years later. In the late 1940s, it was transformed by law into the National Institute of Colonization.

Agricultural activities were mechanized at the end of the period (1945–1955), when the number of tractors was multiplied by seven. Until then, for the most part they were carried out using animal draft, even though mechanization had made headway during the entire period. Despite the fact that mechanization was promoted as a source of progress, several authors and public spokesmen emphasized the character of livestock in the country (Mullin, 1935). Mentions were made of the climatic variations and the poor aptitude of the soils – especially when compared with those of Argentina – to sustain a productive agriculture. The convenience of an activity was measured – and still is – by its insertion possibilities in the international market; agricultural products did not show the conditions to do so during this period, even when they had various state support.

The meat and wool production that prevailed from a social viewpoint of territorial extension and economic importance allowed territory occupation in an economically viable manner; it was the source of foreign currencies necessary to exchange them notably for machinery and oil, whose importance had increased throughout the century. The dairy production has rapidly integrated the industrial stage. A national cooperative (CONAPROLE) was created in 1935 to mediate between producers and consumers and offer hygienic-sanitary guarantees, even though in 1948 cows were still being milked for direct sale to the population in the center of Montevideo. The native forests were a source of firewood and charcoal, and forests' plantations were almost nonexistent. The industrial structure was the link to overseas markets for meat products, it was almost non-existent for wool, and it supplied the domestic market with milk, wheat, oilseeds and other products.

Some sectors, linked to the political leadership, proposed at the end of the period two development models with different foundations: an industrial development to supply the domestic market and eventually export, or livestock intensification that

would improve the country's international insertion. The 1950s were particularly agitated with ardent defenders of each of the two alternatives. Eventually, a new actor helped to tip the balance toward livestock intensification: the financing of international organizations, in the present case the World Bank. It is interesting to note that crop intensification, which occurred some decades later, was not included in the list.

## 1960–1980 "MORE OF THE SAME BUT DIFFERENTLY"

At the beginning of this period, a series of studies resulted in a comprehensive development proposal (CIDE [Development Studies Interdisciplinary Board]), and the creation of the statistics and analysis government offices (DIEA [Agricultural Statistics Office], DINACOSE [Livestock National Office], NAC [National Meat Institute]), which continue today to make Uruguay a country that is distinguished by the availability of data related to the functioning of its society and dynamics.

These years were marked by a violent social crisis, including the installation of a civil military government in 1973. With regard to an agrarian policy, a general withdrawal of the State from direct economic activities, e.g. cereals storage, slaughterhouse administration, was noted. This set the basis of an economic organization model that is still in place today. The turning point occurred in August 1978, when the State put an end to its fixing the price of cattle for slaughter and withdrew from a series of administrative measures that regulated meat production and trade.

New ways to use the land were tested, such as crop livestock rotations in time and space, a technology that is reputed to be typically Uruguayan and that arises from the integration of essays and various technological advances proposed by different actors. One recalls that the desire to boost farming modernization and intensification expressed itself by the creation in 1962 of the Center for Agricultural Research, which has been present across the country and has specified the country's objectives to develop based on its agricultural sector. Rice cultivation, geographically and technologically dissociated from the rain-fed agriculture that dominated the landscape until then, came out in force.

With regard to cattle, the period was marked by the promotion of the 'New Zealand model' promoted by the World Bank with the enthusiastic support of the successive governments, leaders of organizations linked to cattle ranches, and cattlemen. The foundation on which it was based was that "natural pastures are not good for Uruguay" (Mac Meekan, 1951) and should be replaced. At the end of the period, in 1980, it was estimated that almost all farmers had tested the new technology proposal based on loans administered by the Banco de la República (Alonso and Pérez Arrarte, 1981). At the same time, it became obvious (Jarvis, 1981) that the potential for change in livestock meat and wool, in a context of high economic and political instability, and with a great variability of ecological niches, was very

limited. Traditional natural pastures had been replaced in 12% of the total area by sown pastures. This data remained unchanged for 35 years. The proposal appeared with strong advantages to be introduced in the rain-fed crops and dairy production areas, which in the end have been its main contribution.

The international context was particularly unfavorable for the temperate climate products offered by Uruguay, especially beef. The USA, favoring its allies in the South Pacific, had set up the 'foot-and-mouth disease circuit', which, with inferior products (basically lean cows), doubled prices and was much more stable than the one faced by Uruguay. The foot-and-mouth disease market, in turn, had to absorb the enormous surpluses that at liquidation prices overturned the new European Economic Community. This left Uruguay with very marginal markets for its meats, and made impossible its access to international markets with products such as wheat or sunflower. This situation manifested itself especially when the political crisis was at its worst. In 1974, meat and wool exports that had constituted more than 80% of the total exports for about a century were not enough to pay for the needed oil import. This caused serious constraints on people's daily life and, of course, compromised the country's development. International firms were not in the least interested by the local slaughterhouse industry, in contrast to what had happened at any other time. In this period, the meat packing industries were handled by the State (initially), and by local entrepreneurs.

This period was also characterized by the beginning of urbanization and the rural exodus that continues today. The rural population reached its peak around 1955, and from then on declined more or less rapidly, in association with its much reduced access to services and generally noneconomic social interactions. The number of farms also decreased and concerned almost exclusively those with less than 100 hectares.

Some environmental, ecological, conservationist concerns have led to indigenous forest protection legislation, industrial forestation promotion, and cultivation standard promotion aimed at soil conservation. Social concerns have been expressed via actions to end the era of *rancheríos* ('huts'), task that was entrusted to the Movement for the Eradication of Unhealthy Rural Housing (MEVIR), financed by a tax on the sale of agricultural products.

## 1980–2000: CONSOLIDATION OF NEW ACTIVITIES

One of the characteristics that describe this period is the State's complete withdrawal from market regulation. The 1978 measures were followed by the State's withdrawal from the wheat market in 1982, and a series of less relevant but symbolically important measures such as the allowance of semen imports, restricted up to that time to farmers belonging to an exclusive organization, or the export of live cattle around 1992.

It should also be noted the consolidation of agricultural activities other than meat and wool, such as milk, rice, barley, wood and other forest products, honey, and citruses, which had the potential to be dynamically included in the international market. Unlike what was attempted in the 1950s, these were not typical industrial products, such as textiles or household appliances, but agricultural products with or without some industrialization.

New foreign corporate economic actors slowly emerged and anticipated what was to come at the beginning of the 21st century. Initially in citrus orchards, with Arab investments, then very clearly in forestation, based on a new forestry law approved in 1989, corporations were present, with organizational models that not only dissociated the ownership and management of farms, but also separated those affected by the changes, the local inhabitants, the national society, from the beneficiaries, who were increasingly faceless foreigners, such as the various acronyms that were shown as forest plantations owners. It was not entirely new. They had been represented by the English presence in the production and meat industry at the end of the 19th and the beginning of the 20th centuries, but their presence acquired a dimension that would only grow from then on.

From the livestock technological viewpoint, efforts are still being made to set up crop and livestock rotations that promise to increase meat production and stabilize agricultural incomes. If we focus on livestock public policies, we can say that it maintained its secular definition, as Piñeiro and Moraes (2008) wrote: "Policies for the agricultural sector during the 20th century have been closely linked to the national international insertion style." In the case of livestock, from this period onward they aimed at ensuring the sanitary quality of products, certifying compliance with commercial demands, and in general facilitating and promoting foreign trade. An important change is the permanent decline in wool and sheep production, despite some efforts to develop sheep meat products that could mitigate the effect of the decline in the wool price. Another notorious fact is the gradual reduction in the slaughter age of steers, which is an indicator of the improvement in physical efficiency, much praised by a sector that has been accused of secular stagnation, which has also highlighted the increase in beef production. Some technical complexities that are not analyzed here cast doubt on the importance of this process, and recent estimates (Bervejillo and Bertamini, 2014) indicate that "when the total agricultural product is disaggregated into extensive agriculture, meat and wool, dairy and forestry, it is possible to see that the great driver of global growth has been extensive agriculture followed by forestation and dairy farming, with beef and wool as the great pendulum [...] the meat and wool livestock [...] has remained stagnant in the last 30 years as a result of the crossed combination of an increase in beef production and a lower sheep production." These authors also report a livestock growth that varies according to the method used from null to + 1% per year for the period 1983–2013.

Rain-fed crop productivity increased after having been stagnant for decades. This was also the case for milk. In both cases there were drastic decreases in the number of farms, a process that had already been fully described in 1958: 'the technological windmill' (Röling and Wagemakers, 1998) explained how those farmers, unable to reinvest in a sustainable way to increase productivity, abandoned the activity when production increased and the price of products decreased, a process well exemplified among others by the wheat and milk production in Uruguay during this period. This has had different manifestations in extensive livestock farming, which fulfills at microlevel patrimonial functions that can be approached by different family organizations, constituting an activity among others within a 'family activity system'.

## 2002: LIBERALIZATION IMPOSES ITSELF

The beginning of the millennium was characterized by a major economic and social crisis (unemployment reached 20% and Uruguay has a weak social security system), which did not end like some similar crises after an institutional breakdown. A cumulative set of circumstances resulted in a fairly high level of indebtedness in the agricultural sector, the shutdown of beef markets because of the outbreak of foot-and-mouth disease, a depressed market for agricultural products, a series of consecutive years of climatically unfavorable agriculture, along with a brutal tension in the country's payment system, with the collapse of banks and losses of deposits by savers, etc. These were the results of tensions accumulated at least since the previous decade.

Following immediately the onset of the crisis, two broadly announced phenomena, whose arrival never seemed to materialize on the Uruguayan scene, appeared. Firstly, China quickly appeared as a commercial partner. It became the main trading partner for almost all products globally by the middle of the 2010s. Secondly, genetically modified organisms promoted a type of large-scale agriculture that in the south of South America formed unique dynamics at global level. In Uruguay, the phenomenon is minuscule compared to what happened in its big neighbors, Brazil and Argentina, and even Paraguay. However, there is a situation that could be unique in history. For the first time the productive structure of an agricultural product, i.e. soybean, is similar to what has been observed in other sectors; only a few actors represent a very large portion of the global activity. In the case of Uruguay, 10 companies account for 50% of the production, a situation unheard of up to now in terms of agricultural production. In our analysis, and in terms of social impact and environmental sustainability, it is important to highlight that livestock has been progressively excluded from areas with good agricultural potential, in which it had always been present.

Uruguayan producers, pressured by debts, sold or rented their lands. This phenomenon is related to the ongoing social changes. Given the absence of long-term

family projects concerning their farms, producers tend to sell or rent their land and quit the farming sector. In addition, according to the new model, the organization of the companies requires skills and involves taking risks that only in some cases can be met by Uruguayan 'agricultural entrepreneurs'. The other side is the emergence of gigantic agricultural companies, which manage areas up to 5000 times larger than those average farms (180,000 hectares when the average area is 360 hectares).

Public policies of this period are characterized by the attempt to reconcile different dynamics and aspirations. Promoting exports by maintaining a socially inclusive functioning that takes care of natural resources is a motto that characterizes the Government's discourse. In this context, extensive livestock gains some prominence because it is the main activity of family farming according to the official definition. The State's actions that promote international inclusion are expected to continue. International funding struggles to put climate change on the agenda, and other techno-bureaucracies promote actions related to family farming. There are advances in labor legislation. With the agricultural surface area increase, new conservation land rules have emerged whose actual application remains in dispute.

With regard to livestock, little has been done other than implementing a very sophisticated individual traceability system to improve the competitiveness of Uruguayan beef and its inclusion in markets. In addition, the agricultural sector is challenged by inaction against the foreign takeover of the refrigeration industry, rice processors, or the development of the cellulose and wood industry. Concerning major Uruguayan exports such as beef, bovine hides, milk and dairy products, soybeans, barley, rice, wood, cellulose, only milk has remained managed by national actors. However, the recent arrival of the global dairy processor LACTALIS raises questions as to whether this situation will last.

The definition by the World Organisation for Animal Health (OIE) of a unique sanitary status for Uruguay ("free of foot-and-mouth disease with vaccination") and its validation by the USA allowing the re-entry of Uruguayan beef into its market are probably the most significant event of the period where livestock operations are concerned. The real effects of the proposals for differentiation of Uruguayan products – highly publicized by the administration – are very controversial.

## CONCLUDING REMARKS

This article briefly presents the case of a country with a small population in relation to its capacity for producing food for people. This situation implies a tight, permanent interaction with the international arena as the natural destination of its products, where commercial and other kinds of interests are carried out by different stakeholders. At the same time, it shows the ancient and still ongoing controversy around subjects such as the convenience of family farms, the omnipresence of the private propriety with all its consequences, the growing awareness

of the ecological consequences of human activity, and a social and technological evolution with some permanent traits: a pragmatic equilibrium among conflicting goals.

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