

INTERNATIONAL FOOD & AGRIBUSINESS MANAGEMENT ASSOCIATION
22st ANNUAL WORLD SYMPOSIUM
Shanghai, China
June 11-14, 2012

“ANIMAL WELFARE: THREAT OR OPPORTUNITY FOR BUSINESS?”

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Abstract

Argentina is an important player in the animal protein businesses and a country with low primary production costs in an environment of important trade opportunities. This is the situation for both poultry sectors: broilers and layers. The objective of this paper is to assess the state of animal welfare in the poultry agribusinesses and analyze its impacts on productive systems. At farm level, there is a large difference between and within the broiler and egg production sectors in Argentina. Whether the Argentinean sector can use opportunities for increasing animal production and adapt it to global demands will partly depend on the policy of the government.

Key words: *productivity, viability, global consumer.*

1. Introduction

Animal welfare receives more legislative attention in the European Union (EU) than in most other regions of the world. Standards for poultry are generally taken to be higher in the EU than in producing countries exporting to the EU, particularly developing countries. The recent action plan for animal welfare introduced by the European Commission aims to further expand the body of regulatory standards (Van Horne & Achterbosch, 2008).

The EU position is partly induced by specific features of the production environment. In addition, policy-makers claim that EU consumers have increasing preferences for the welfare of production animals (European Commission, 2006). Consumer researchers have revealed a wide divergence in the ambitions and motivations of private labels in the EU regarding animal welfare (Ingenbleek et al., 2007).

At the same time, the dilemma with no apparent solution, between the lack of food for an increasing demand in quantity and quality, and the sustainability of the production processes has raised several questions on what sustainability really is. The paradigm of the “4 E’s” proposes that sustainability must be analyzed in terms of Economics, Environment, Energy and Ethics. Animal welfare must take into account all these factors in order to be sustainable in the long run and actually provide a solution.

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Producers in developing countries also achieve levels of animal welfare that exceed regulatory minimum levels to a different degree. Selected agribusiness systems in developing countries already comply, or potentially will comply with EU standards for farm animal welfare and should be allowed to export their products to the EU (Van Horne & Achterbosch, 2008).

Argentina has traditionally been an important player in the animal protein businesses, being a well-known beef supplier, currently gaining share in the chicken global market and with opportunities to become an important player in the egg business as well.

Argentina is currently positioned as the 9th producer of broiler meat, with 1,425,000 metric tons in 2009. It enjoys comparative advantages that determine an important potential for the activity. Since 2003, broiler production has more than quadrupled, and exports have exceeded imports, representing 16% of the total produced. At present, Argentina exports chicken and by-products to 81 countries. In terms of egg production, Argentina is currently positioned as the 25th world producer in terms of units (0.79% share of global production) and the 19th world producer in terms of volume (0.93% share of global production). It is important to state that both production and domestic consumption have almost doubled since 2001, and due to its comparative advantages, the country has the potential become a global provider of hen eggs and by-products. According to CAPIA (Argentine Association of Poultry Farmers) estimations the whole of the Poultry sector in Argentina (Broilers, Layers, Breeders) employs over 132,000 people both directly and indirectly.

In that sense, and given the evolution of the characteristics of demanding markets, the need arises to know the conditions in which poultry production is developed in order to evaluate its status in terms of animal welfare.

2. Objectives

This paper emanates from a broader work undergone by the Food & Agribusiness Program at the University of Buenos Aires and the Agriculture Economics Research Institute (LEI) at Wageningen University on Husbandry practices and animal welfare in Argentina (Van Horne et al., 2010). The general objective of this paper is to assess the state of animal welfare in the poultry (egg and broilers) agribusinesses and analyze their impacts on productive systems. In order to become acquainted with the state of animal welfare in poultry production in Argentina, the research centred around the following aspects: 1) description of the Poultry (broiler and egg) Agribusiness Systems (ABS), 2) aspects of the regulatory framework in force with respect to animal welfare, 3) survey of animal welfare indicators in productive systems.

2. Materials and methods

2.1. Survey methodology

Standardized surveys were performed on 116 companies that operate in Argentina, 40 in the broiler sector and 30 in the egg sector: the composition of the population surveyed consisted of roughly 1/3 large operations, 1/3 medium-sized operations and 1/3 small operations for each sector.

A standardized survey was made of businessmen and broiler producers that covered 11 main broiler producing and processing companies in Argentina

and their coordinated producers, taking the population up to 40 surveys. These companies concentrate around 60% of the national broiler production. 40 broiler producing units were surveyed, which form part of the coordinated production of the companies or of their own production.

Out of the 30 companies assessed in egg production, 13 were from Buenos Aires, 6 from Entre Ríos, 4 from Córdoba, 2 from Santa Fe and Mendoza and 1 from Salta, San Juan and Río Negro.

2.2. Agribusiness System analysis

The Agribusiness Systems approach (ABS) has its origin in two different conceptualizations, developed at different places and times but showing similarities with respect to the structure of productive systems.

The first of these is based on the work of Davis and Goldberg (1957); these were the first references to the study of agribusiness and introduce the concept of “Agribusiness” as a new alternative to the approach of the old concept of agriculture. Later, Goldberg (1968) adds that “Agribusiness” is a broad concept in a vertical sense, “from the field to the table”, incorporating within this new frame from Research and Development (R&D) to the final consumer and institutions. This author discusses coordination aspects in agribusiness, relating contractual relations, coordinating institutions and vertical coordination and integration. This determines the definition of a “Commodity System” as an aggregate of several transformations of a product along a vertical chain oriented towards the consumer.

On the other hand, the concept of “*filière*” originates in the French school of industrial organization that applies a sequence of activities that transform a commodity up to the final consumer (Morvan, 1985, in Zylbersztajn, 1996): “(...) the *filière* is the sequence of operations that allows the production of goods. Its articulation is influenced by the technological possibilities and is defined by the strategies of the agents who look for a maximization of their wealth. Relations between agents are those of interdependency or complementarity and are determined by hierarchy forces.” This approach focuses on non-price coordination and especially on the industrial aspects of the product.

Zylbersztajn (1996) is sustained by the contributions of these two currents as far as descriptive capacity and the definition of vertical systems around a product and also presents coordination, the limitations of the price mechanism, the influence of the institutional environment, the distribution aspects and the competitive environment as relevant issues (Theory of Modern Industrial Organization).

In 1995, he proposed that the Agribusiness System (ABS) should be studied as a set of contractual relations between specialized businesses with the object of satisfying the consumer. In relation to this, according to Zylbersztajn and Neves (2000), ABSs contain the following fundamental elements for their descriptive analysis: agents, relations between them, sectors, support organizations and an institutional environment. Based on these, the authors define the business network theoretical model. In this sense, the process consists in analyzing a business and its group of suppliers and distributors, the relationships that exist among them and the relation to the environment. In essence, it is an interaction and relations approach (Neves, 2007).

3. Brief description of the broiler and egg Agribusiness Systems (ABS) in Argentina

The purpose of this chapter is to characterize the Argentine poultry Agribusiness Systems (ABS) by defining the links and actors that compose it, as well as to present quantitative information about it. In this sense, the poultry ABS must be subdivided into two subsystems: broiler production and egg production, because of their technological and organizational differences. Chapter 3.1 will refer to the Broiler ABS, while Chapter 3.2 will refer to the Layer ABS (egg production).

3.1 The Broiler Agribusiness System in Argentina

At present, Argentina is positioned as the 9th producer of broiler meat, with 1.43 million tons in 2009, which represent 2% of the total produced in the world. Worldwide, the United States, China, Brazil and the European Union account for about 67% of the production (Table 1).

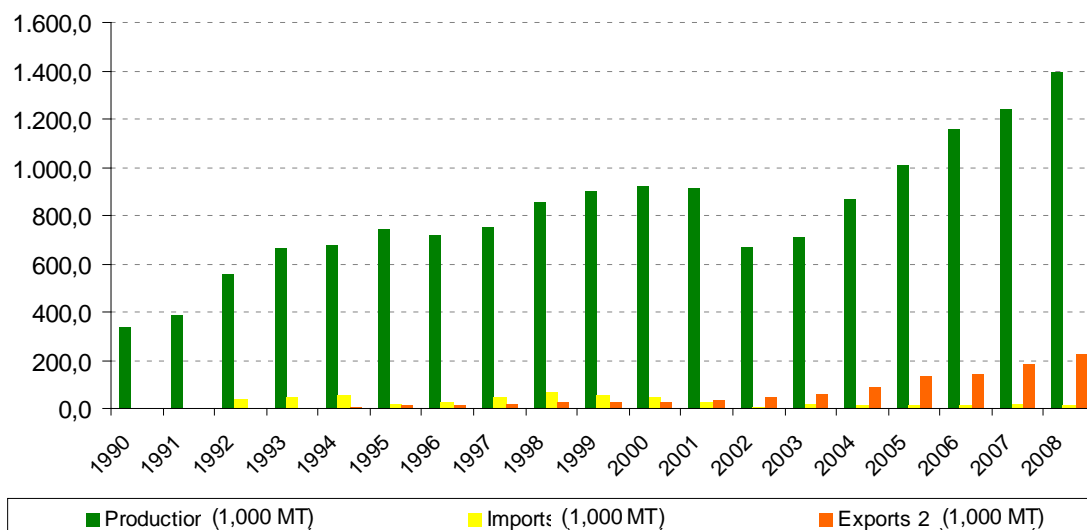
Table 1: Global broiler meat production, ranking of the top ten producing countries

Ranking	Country	Production in 2009 (1,000 MT)	World Participation
1	US	15,919	22.3%
2	China	12,133	17.0%
3	Brazil	11,360	15.9%
4	EU-27	8,600	12.1%
5	Mexico	2,795	3.9%
6	India	2,350	3.3%
7	Russia	1,775	2.5%
8	Iran	1,430	2.0%
9	Argentina	1,425	2.0%
10	Japan	1,260	1.8%
	Rest	12,307	17.2%
	Total	71,354	100.0%

Source: the authors, based on FAS – USDA.

The activity in Argentina has been on the rise especially since the 1990s, when a process of reengineering of the business took place within the organizational environment and investments in process and product assets increased, allowing the sector to venture into the world poultry business. The Graph 1 shows that broiler farming in Argentina has grown steadily, except during the 2002 setback as a result of the economic crisis in the country at that moment. Production has more than quadrupled, and since 2002, exports have exceeded imports, representing 16% of the total produced.

Graph 1: Evolution of production, imports and exports of chicken 1990 - 2008.



Source: the authors, based on data from MAGyP- Small and Farm Animals Directorate - Poultry Area.

According to estimates made in 2008, (Table 2) the sector GDP was 2,004 million dollars, which represented about 0.61% of the GDP.

Table 2: Broiler GDP, 2008.

2008 GDP		
Internal Market Sales (thousands of U\$S)	1,693	million
Exports (thousands of U\$S FOB)	311	million
Total	2,004	million

Source: the authors, based on data from MAGyP and BCRA.

Both fatteners and industrialists are grouped in chambers (CAPIA and CEPA respectively), and have implemented joint strategies through a strategic plan for the promotion of the activity. In the present business design, the coordinating industries provide the fatteners the feed and the baby chicks, as well as technical advice.

In Argentina there are 3,926 broiler farms. The province of Entre Ríos concentrates 56.5% of the farms, followed by the province of Buenos Aires, which has 41.5% of them. There have been changes in the scale of the farms, which have shown a tendency to become larger. Qualified informants interviewed in this work agree that the size of the farms has been increasing in the last few years with the growth of the activity. An estimated 20 % of the farms have an installed capacity lower than 10,000 broilers per breeding cycle; 55 % of them are between 10,000 and 20,000 broilers per breeding cycle, and the remaining 25 %, over 20,000 broilers per breeding cycle.

As with production, slaughter is concentrated in the provinces of Entre Ríos and Santa Fe, where a group of six leading companies account for over 50% of the total slaughter of broilers. Approximately 17% of the broiler meat produced is processed in pieces, cold meats and giblets. Broiler meat production, estimated on the basis of slaughter in plants with or without SENASA authorization, also increased with respect to the previous year,

totaling 1.4 million tons (1.24 million tons in 2007) (SAGPyA (currently MAGyP: Ministry of Agriculture, 2008).

The distribution of broiler products, both broilers and processes products, is done through distributors or wholesalers (55- 65%), hypermarkets and supermarkets (25-30%) and retailers, food services and institutional consumption (10-15%).

The total apparent consumption of broiler meat in Argentina, mainly broiler, has grown vigorously in the past 10 years, from 792,000 tons in 1997 to 1,254,000 tons in 2008. Current per capita consumption of broiler meat is 31.47 Kg./capita/year. CEPA estimates that by 2015 consumption will have reached 34 Kg./capita/year.

Exports of broiler products and by-products have been on the rise since 2002. In 2008, they reached 223,000 MT for over 310 million U\$S FOB, representing 16% of the total produced. Whole birds are the main product imported (40% of the exported volume; 44% of its value), followed by other edible products, which represent 21% of the volume and 16% of its value. Exports have destinations in 93 countries. The most important, Chile, represents 21% of the volume and 16% of the value of exports. It is followed by China, with 11% in volume and 9% in value. Venezuela has become the main market for exports of fresh broiler meat, receiving 22% of the volume. Of the five main destinations for poultry and by-products, Germany represents the highest FOB value per MT, U\$S 3,020. It is worth mentioning that in 2008 Venezuela became the main market for exports of fresh broiler meat. Historically, this country was not considered an important buyer; however, in 2008, 22.2% of the volume of exports was destined to it.

Broiler imports in 2008 represented 0.9 % of the estimated national production, with 13,400 tons. The main import origin was Brazil, and the main products imported were non edible products (flours for animal feed, cartilage, other). Imports have been dropping (from a maximum of 66,000 MT in 1998), as a consequence of anti-dumping measures taken after an investigation conducted by the sector.

3.2 The Layer Agribusiness System in Argentina

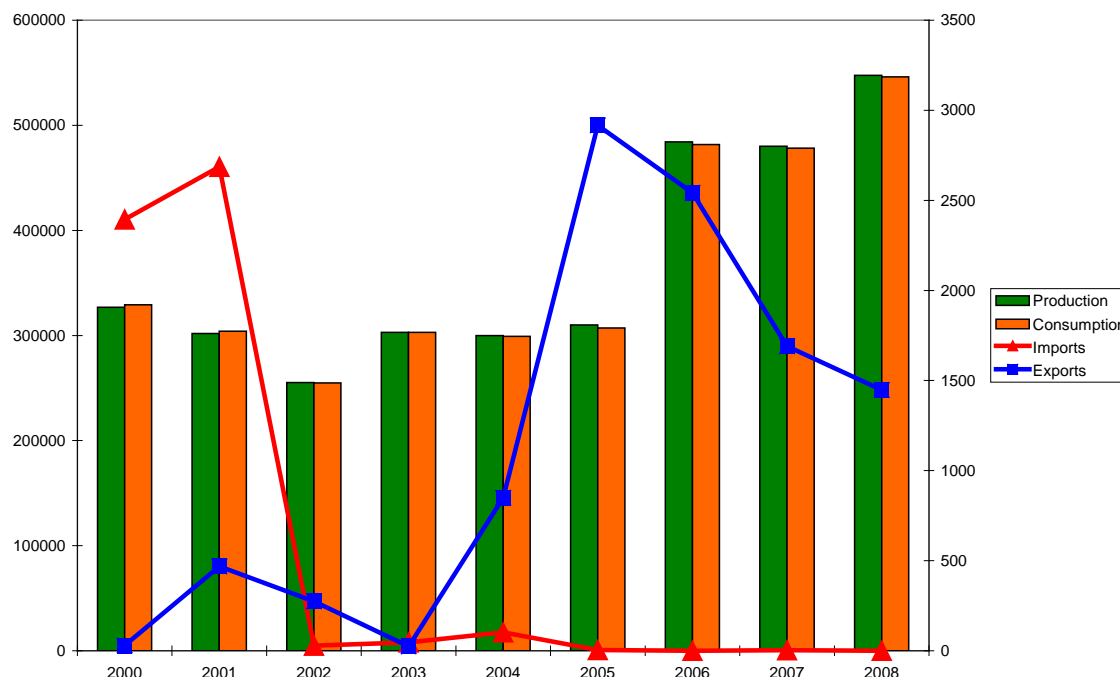
Argentina is the 25th world producer in terms of units (0.79% share of global production) and the 19th world producer in terms of volume (0.93% share of global production). The largest egg producers in the world are China, the USA, India and Japan. In fact, the top 8 producers concentrate over 77% of total world production.

Commercial egg production in Argentina is a 40-year old business, and it had been relatively stable in production up until the mid 90's, when the sector grew at a higher rate in production, revenue, industrialization and exports.

It is estimated that currently, the number of layers in production in the country is about 33 million. During the year 2008, Argentina produced 8.77 billion eggs (about 548,000 MT) of hen eggs in shell; this represents a 67.6% increase during the 2000-2008 period, and over a 100% increase since 1994. The overall development of the Hen Egg ABS can be observed on the next graph. It is important to state that both production and domestic consumption have almost doubled since 2001 and that although some imports occurred at

the beginning of the decade, currently they are practically inexistent, and on the other hand exports have grown over the same period of time.

Graph 2: Argentine egg in shell production, consumption, imports and exports (in MT, production and consumption are shown on the left axis, imports and exports are shown on the right axis).



Source: The authors.

Out of total Argentine egg production of 2008, over 11% was consumed by the industry, representing roughly 280 million US Dollars and about 1% was exported, accounting for 24.3 million US dollars and representing just over 1.05 billion eggs combined. The remaining 7.72 billion eggs (representing roughly 644 million US dollars) were sold domestically through various formal and informal channels, including wholesalers, supermarkets, minimarts, direct sales to end users (consumers), local and regional small retailers, fairs and self-consumption. The overall sales of the sector added up to 948.3 million US Dollars during 2008, representing about 0.29% of overall Argentinean GDP. The following table shows this information.

Table 3: Hen Egg Agribusiness System, 2008. Sales.

SALES 2008		
Domestic market sales (US\$)	644	millions
Industry Sales (US\$)	280	millions
Exports (US\$ FOB)	24.3	millions
Total	948.3	millions

Source: The authors, based on SAGPyA y BCRA data.

Egg production in Argentina has traditionally been a very heterogeneous business, with very important variations in scale of production, technology and formality levels. To this day, about 35-40% of the production is still being done with low or very low levels of technology, small scale, obsolete stalls and very high restrictions to maintain production throughout the year. At this scale of production and level of technology there exists a great deal of informality, both fiscal and sanitary. On the other hand, almost 60% of current egg production is

done under systems of medium to high scale that use higher levels of technology (in accordance to scale) and have an adequate sanitary status.

An increase in the levels of technology can be observed, with larger and more technological operations being launched and the modernization of some existing operations. The sector is tending towards more formality, with informal and backyard producers decreasing the participation in the business as a whole. Added to this, production is tending towards more vertical integration, such as large scale models, in which the farmer owns the inputs, the stalls, the layers and the egg produced, unlike what happens with broilers where most of the production is done through vertical coordination. Typically, large scale producers own the pullets as well, but grow them until ready for laying in a separate farm, due to health issues. Most egg producers market their eggs with no brand, in bulk, although the larger producers have brands of their own and sell both in bulk, as well as in smaller cases, typically by the dozen or half dozen. Layer operations are highly concentrated in geographical terms with the central region of the country being, by far, the most important producer. The top 5 producing provinces (Buenos Aires, Entre Ríos, Santa Fe, Córdoba and Mendoza) account for about 89% of the total number operations of operations across the country, and the first two provinces account for almost 64% of the country's operations.

The egg ABS is mainly oriented towards the domestic market, with less than 1% of total production being exported. A strong increase in domestic consumption both as a whole and per capita has been responsible for the larger part of the increase in production; Argentina is now consuming 217 eggs/year/person. Nevertheless, what is of relevance is the fact that Argentina has shifted from importing eggs and egg products at the beginning of the decade to exporting them presently.

Egg industrialization has been also growing, currently consuming over 11% of domestic consumption. It is the most dynamic in terms of foreign market and contributed to reversing the country's situation from being an importer of egg products to being an incipient exporter (Argentina is the 15th world exporter of industrialized eggs). In terms of industrial process, Argentina exports 2,300 MT of dried egg and over 250 MT of liquid egg and in terms of component, the country exported 1,578 MT of yolk products and 970 MT of albumen products during 2008. In terms of value, processed egg products added up to 14.6 million US dollars; while eggs in shell's export value was 9.7 million US dollars, for an added value of 24.3 million US dollars. Argentina's main destinations for industrialized egg products are Angola (22%), Austria (22%), Russia (11%) and Belgium (8%).

The value of the whole ABS can now be estimated at about 950 million US Dollars and it is expected to keep on growing in value, volume and product diversity over the next few years.

4. Brief description of the state of Animal Welfare regulations in Argentina

Animal welfare was identified as one of the priorities of the World Organization for Animal Health (OIE) with objectives and actions within the Strategic Plan for the 2001-2005 period. The definition of Animal Welfare that this Organization proposes is the same adopted in Argentina by the institutions directly involved in the topic; this definition states that animal welfare is the way

in which individuals cope with the environment, and this includes their health, their perceptions, their mental state and other positive or negative effects that influence the physical and psychological mechanisms of an animal. Additionally, the National Service for Health and Quality of Agricultural Food Products (SENASA, 2004) includes in the definition *“the set of measures taken to diminish the animal’s tension, suffering, trauma and pain during its transfer, exhibition, quarantine, commercialization, exploitation, training and slaughter.”*

According to a study conducted in several Latin American countries, the adoption of animal welfare principles and regulations is directly related to the possibility of and interest in exporting (Rojas et al., 2005). This is the case in countries that export to demanding markets such as the European Union and obligatorily covers the aspects of slaughter and transportation, while in general the production aspects are voluntary.

Argentina has promulgated partial legislation, not directly related to Animal Welfare, but to connected topics. In Argentina in particular, there are public and private institutions oriented towards the topic that have published guidelines and reference manuals for the orientation and implementation of animal welfare in the country. In spite of this, animal welfare criteria are scarcely applied by producers, transporters, processing plants, and so on (Figuroa, 2008).

In all cases, the general criterion of animal welfare practices in Argentina (Figuroa, 2008) and worldwide is based on the five freedoms. The animal must be free from:

1. Hunger, thirst and malnutrition.
2. Fear and distress.
3. Discomfort (physical and thermal).
4. Pain, injury or disease.
5. Must be able to express normal behavior.

In particular in Argentina, most of the information found on animal welfare refers to bovines. Studies performed in the country have shown that the losses sustained because of ill-treatment, stress, poor handling, and bruising of the meat, among others, are reflected in a significant economic damage for the industry. For instance, in 2004 the University of Tandil (UNCPBA), together with the Institute for the Promotion of Argentine Beef (Instituto de Promoción de Carne Vacuna Argentina - IPCVA) conducted a study on slaughterhouses to calculate the losses due to poor handling and a lack of animal welfare policies (Figuroa, 2008). These losses were only quantified at the slaughterhouse; even today there are no studies that reveal losses incurred from weaning (primary production) to the moment of slaughter. According to INTA (2008), the advantages of animal welfare perceived in Argentina are centred fundamentally on aspects such as food safety and quality.

The most generic reference to the topic is Law N° 14.346 dated 1954, which refers to animal protection before acts of ill-treatment or cruelty. This is a penal law, which leads to the conclusion that, in Argentina, ill-treatment of animals is a penal crime. As a complement to this Law, other legislative advances were found in relation to the topics of health, euthanasia, transportation and organic production. Table 5 summarizes the legislation covering animal welfare in Argentina.

Table 5: Synthesis of current animal welfare situation in poultry production in Argentina: legislation and documents.

Topic	Law 14.346	Procedure Manual on Animal Welfare	National Registry of Means of Transportation (Res 97/1999)	Manual of Good Transportation Practices	State of the Art of Animal Welfare
Institution	National	SENASA			INTA
General treatment, handling, feeding, rest, etc.					
Production					
Transportation					
Slaughter					
Characterization of problems					
Recommendations					

Source: the authors.

5. Results of the surveys conducted

5.1 Broilers

The current broiler business design –slaughter coordinated with finishing– has given rise to a high standardization of broiler production. Approximately 95% of the broiler farms are coordinated with the processing industries. Eleven of the main companies producing and processing broilers in Argentina were interviewed, and information was gathered on 40 productive units linked to those.

The productive units surveyed are located in the province of Entre Rios (75%), followed by those in Buenos Aires and Córdoba. An average of 2 to 3 sheds per farm was registered. The average surface of the sheds in the sample was 1,500 m². The average age of the sheds was 10 years, a datum that coincides with the recent innovation of the broiler industry in Argentina (mid-1990s). The most common bird density is 10 birds/m².

In general, shed ventilation is natural (42%), and is combined with mechanical systems such as ventilation fans (25%). 22% of the units in the sample have automatic ventilation systems (fans and tunnel system), found in the newer, more technologically developed sheds. The ventilation capacity of the sheds is undefined for most of those surveyed; however, calculations made on the information provided make it possible to estimate a value of 17 m³/bird/hour in those sheds with tunnel ventilation systems. 65% of the productive units have automatic feeding systems; 87% have nipple drinking systems. 82% have fogging refrigeration systems. 97% have gas bell heating. 70% have compacted soil floors. Bedding is rice chaff in 82.5% of cases.

Average light during the period of breeding of the chicks is 17 hours, and average darkness is 8 hours. During the first two weeks of light, there is almost no darkness. The catching method is 100% manual. The production break of the sheds lasts an average of 14 days and the total cleaning of the shed (manure removal and bedding renewal) is done twice a year. The most widely used breed among those surveyed was AA (45%). The duration of the fattening cycle averages 48 days to obtain an average weight of 2.6 kilograms. The daily weight gain is 55 grams and the average feed conversion rate is 2.02 kilograms. The average mortality rate was 5.5% for the entire fattening period.

Transportation is done in crates (80 cm x 50 cm x 35 cm) at an average density of 8 birds per crate. The average duration of transportation is 1 hour, associated to the regional character of the activity. The production and processing stages are concentrated geographically. Mortality rate during transportation is less than 0.05%. As for slaughter quality criteria, they are established by the processing companies, which in general agree on avoiding ill-treatment of the animals in order not to affect the quality and presentation of the meat.

5.2 Layers

The business design in layer production is almost entirely vertical integration and this is the main difference with what happens with broiler production where contracts are much more common. The survey conducted included 30 operations, 10 of each scale (small, medium-sized and large).

Operations were mainly located in Buenos Aires (43.3%), Entre Ríos (20%) and Córdoba (13.3%). In average, the number of stalls was 7.4, with an average size of the stall at 4,750 square meters. Their average age was 11.4 years, with an average size of the flock at 377,470 layers per operation and 42,000 per stall. Ventilation is generally mechanic (over 75%), while feeding used some sort of automation in 86.7% of the operations and water supply was automatic in 90% of the operations. Regarding cooling, 27 out of the 30 surveyed operations had a cooling system, while just 4 out of the 30 companies assessed having a heating system. As for manure handling, 16.7% of the farms had a manure belt system, while the remaining 83.3% used the open pit format. With regards to the egg collection system, 26 out of the 30 surveyed operations used an automatic system.

In terms of rearing, it is important to establish that not all of the operations had their own rearing system. Regarding rearing location, just 3 of the operations that were assessed (10%) had the rearing house at the same location as the layer house. As for the rearing system, 83.3% of the pullets were reared in cages, while 16.7% were reared on litter floor. Transfer from the pullet to the layer house happens at the average age of 18.2 weeks, with the most efficient farms transferring them at 16 weeks.

In terms of management, the survey showed that 13 operations used little daylight, 9 operations used bright daylight and 8 operations used dark house systems. As regards light schedule, the average amount of dark hours per day added up to 7.8 hours. The empty period between flocks averages about 22 days. Regarding performance the average length of the laying period was about 532 days. During this process, the average amount of eggs laid is 352.5 of which an average 11.5% of the eggs are second grade eggs. Regarding feed indicators, the average feed intake in the surveyed operations was just over 160 grams per day and the average conversion rate observed was just below 2.8 kg of feed for each kg of eggs produced. In terms of mortality rate, the average percentage observed in the surveyed farms was just over 9% and the main causes of layer mortality were temperature related problems, prolapse and age.

Layer transport from the layer house to slaughter is done by truck in crates or boxes that carry in average 8 or 9 birds. The average transport period

is just below 2 hours, in which the birds are transported to the slaughter house and transferred.

6. Conclusions

Argentina is a country with low primary production costs. This is the situation for both sectors: broilers and layers. This means that Argentina has a large potential to be an important player on the world market and be competitive on the world market with other important exporters like Brazil or the USA. The low civil density, low environmental pressure and abundant space contribute as well.

Looking at the current situation at farm level it can be concluded that there is a large difference between the sectors. The husbandry conditions directly related to animal welfare are relatively good for broilers. For layers the conditions are below the average situation in EU countries in North-West Europe. For layers in particular the average space allowance per hen is below the EU level and far below the new level implemented in 2012.

In both sectors small improvements can be made to increase the animal welfare level. Many of these improvements also directly result in financial gains for farmers through better performance and improved quality. Some examples are lowering the mortality rate, better ventilation, better handling before transport, better conditions during transport.

For raising animal welfare to EU standards in the layer sector, an overall change in husbandry systems is necessary in Argentina. New housing systems (enriched cages or floor housing) have to be introduced for layers. Changing to this type of husbandry will increase the production costs. And even though these animal welfare measures could lead to additional costs in Argentina, these probably will be lower than the additional costs for farmers in the EU because of the comparative advantages in land prices and labour costs in Argentina. However, Argentinean farmers will need to see their additional costs compensated, for example through higher prices in the market. At this moment there is no market in Argentina for any 'welfare friendly' products, but there is one abroad - the EU. The only opportunity to get a market bonus for the added value products would be export to the EU. To take this opportunity the Argentine poultry sector should actively approach the market (partners) and look for the dialogue and possibilities to sell high value animal welfare products.

The paradigm of the "4 E's" is of key importance to understand how these policies may affect these businesses in the long run. Animal welfare practices must lead to gains in the economical, ethical, energetic and environmental aspects of production for it to be truly sustainable. Animal welfare must take into account all these factors in order to be sustainable in the long run and actually provide a solution.

Whether these sectors in Argentina can use such opportunities will partly depend on the policy of the government. The economic instability is a risk, resulting in limited credit availability, a quite high lending rate and uncertainty regarding if investments will pay for themselves. A risk can also be found in the export tax system, which rates can change rapidly, since export taxes are used as a political instrument. Finally, certification and verification is relevant when exporting to the EU. So there will be a need for an independent monitoring system to be able to guarantee the product specifications of exported products.

7. References

- Davis, J.H. & R.A. Goldberg, 1957 A concept of agribusiness. Division of Research. Havard University, Boston, 136p.
- Figueroa, M.E., 2008. El estado del arte del bienestar animal en la Argentina. Instituto Nacional de Tecnología Agropecuaria (INTA) - Documento Interno. www.inta.gov.ar
- Goldberg, R., 1968. Agribusiness Coordination: A systems approach to the wheat, soybean, and Florida orange economy. Division of research. Graduate School of Business Administration. Harvard University. Boston.
- Ingenbleek, P., M. Binnekamp & S. Goddijn, 2007. Setting standards for CSR: A comparative case study on criteria formulating organizations. In: Journal of Business Research, 60(5): 539–548.
- Morvan, Y., 1985. L'analyse de filière. ADEFI, Economica. Paris.
- Neves, M.F., 2007. Planificación y gestión estratégica de los sistemas productivos visando competitividad: el método GESIS. In: "Agronegocios en Argentina y Brasil: una estrategia conjunta y una visión a futuro". Editorial Facultad de Agronomía, Colección Agronegocios.
- Rojas H., L. Stuardo & D. Benavides, 2005. Políticas y prácticas de bienestar animal en los países de América: estudio preliminar. In: Rev. sci. tech. Off. int. Epiz., 2005, 24 (2), 549-565
- Van Horne, P.L.M & T.J. Achterbosch, 2008. Animal welfare in poultry production systems: impact of EU standards on world trade - World's Poultry Science Journal - Cambridge University Press
- Van Horne, P.L.M., C.P.A. Wagenberg, M.A. de Winter, R. Hoste, S.I. Senesi, M. Daziano, M. Barilatti, L. Martino & M. Becerra, 2010. The poultry and pig sector in Argentina: Husbandry practice and animal welfare. Report 2010-005. ISBN/EAN: 978-90-8615-409-8.
- Zylbersztajn D. & E. Farina, 1996. Governance structures and Agribusiness Coordination: A transaction cost economics based approach. In: Research in domestic and International Agribusiness Management. Editor Ray Goldberg. JAI Press. Volume 12.
- Zylbersztajn, D. & M.F. Neves, 2000. Economia e gestão dos negócios agroalimentares. Pioneira, São Paulo, Brazil.

Papers consulted:

- Boletín Avícola – Anuario 2008. Dirección de Animales Menores y Granja. SAGPyA, currently MAGyP.
- Comité Interamericano de Sanidad Aviar – CISA. “Bienestar Animal en la Producción de Ponedoras, reglas y estándares recomendados”.
- Estol, L, 2007. Bienestar Animal en Latin America. Documento interno de la Asociación Latin American de Bienestar Animal.
- European Commission. 2006. “Commission working document on a Community Action Plan on the Protection and Welfare of Animals 2006–2010: strategic basis for the proposed actions”. Brussels, European Commission, DG Consumer Protection and Health. European Union.
- Reglamento (CE) Nº 1/2005, del Consejo de 22 de diciembre de 2004.
- Secretaría de Agricultura, Ganadería, Pesca y Alimentos (SAGPyA), 2000. Guía de aplicación de Buenas Prácticas de Manufactura: faena y procesamiento de pollos parrilleros. Documento versión digital: www.alimentosargentinos.gov.ar
- Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA), 2004. Manual de Procedimientos en Bienestar Animal. Dirección Nacional de Sanidad Animal – Luchas Sanitarias. www.senasa.gov.ar

Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA). Manual de Buenas Prácticas de Transporte de Animales. Dirección Nacional de Sanidad Animal – Luchas Sanitarias. www.senasa.gov.ar

Websites consulted:

Cámara de Productores Avícolas. www.capia.com.ar

Centro de Empresas Procesadoras Avícolas www.aviculturaargentina.com.ar

Fundación Argentina para el Bienestar Animal: www.fabaonline.com

Oficina Nacional de Control Comercial Agropecuario. www.oncca.gov.ar

Organización Mundial de Sanidad Animal: www.oie.int

SENASA. www.senasa.gov.ar

USDA Foreign Agricultural Service. www.fas.usda.gov