



The poultry and pig sector in Argentina

Husbandry practice
and animal welfare



The poultry and pig sector in Argentina

Husbandry practice and animal welfare

Peter van Horne

Coen van Wagenberg

Mariët de Winter

Robert Hoste

Sebastián Ignacio Senesi (UBA)

María Mercedes Barilatti (UBA)

Marcos Daziano (UBA)

Lucía Dalila Corrales Martino (UBA)

Mónica María Trujillo Becerra (UBA)

Report 2010-005

February 2010

Project code 31520

LEI Wageningen UR, The Hague

LEI Wageningen UR conducts research in the following areas:

-  Agriculture & Entrepreneurship
-  Regional Economy & Land Use
-  Markets & Chains
-  International Policy
-  Natural Resources
-  Consumer & Behaviour

This report is part of the research area Agriculture & Entrepreneurship.

Project BO-10-006-106, 'Animal Welfare: Argentina as a stakeholder'

This research project has been carried out within the Knowledge Base/Policy Supporting Research/Statutory research Task for the Ministry of Agriculture, Nature and Food Quality, Theme: Bilateral projects, cluster: International cooperation.

Photo's: Mariët de Winter

The poultry and pig sector in Argentina: Husbandry practice and animal welfare

Horne, P.L.M van, C.P.A van Wagenberg, M.A. de Winter, R. Hoste, S.I. Senesi, M.M. Barilatti, M. Daziano, L.D.C Martino and M.M.T. Becerra

Report 2010-005

ISBN/EAN: 978-90-8615-409-8

Price € 18,50 (including 6% VAT)

79 p., fig., tab., app.

This report gives an overview of the current husbandry and management practices in the poultry and pig sector in Argentina related to animal welfare. The research centered on a description of the broiler, layer and pig sector in Argentina, the regulatory framework in force in Argentina with respect to animal welfare and a survey on husbandry practice in the poultry and pig sector.

Dit rapport geeft inzicht in hoe het dierenwelzijn binnen de hedendaagse Argentijnse veehouderijen in de varkens- en pluimveesector geregeld is. Het onderzoek geeft een beschrijving van de vleeskuiken-, leghennen- en varkenssector in Argentinië en van de Argentijnse regelgeving met betrekking tot dierenwelzijn en een overzicht van de veehouderij in de varkens- en pluimveesector.

Orders

+31 70 3358330

publicatie.lei@wur.nl

© LEI, part of Dienst Landbouwkundig Onderzoek (DLO Foundation), 2010
Reproduction of contents, either whole or in part, permitted with due reference to the source.



LEI is ISO 9000 certified.

Contents

	Preface	6
	Summary	7
	Samenvatting	9
1	Introduction	11
	1.1 Problem statement	11
	1.2 Objectives	11
	1.3 Structure of the research	12
	1.4 Structure of the report	12
2	Argentinean economy and governmental policy	14
	2.1 General	14
	2.2 Economy and currency	14
	2.3 Meat consumption	17
	2.4 Governmental regulation of the meat sector	17
	2.5 Feed	18
3	Description of the poultry and pig sector	19
	3.1 Introduction	19
	3.2 Broiler sector	19
	3.3 Layer sector	23
	3.4 Pig sector	27
4	Legislation and institutions on animal welfare	34
	4.1 Introduction	34
	4.2 Legislation and institutions for animal welfare in Argentina	34
	4.3 Animal welfare in Argentina	40
5	Results of the survey on husbandry practice on broiler farms	45
	5.1 Introduction	45
	5.2 General information	45
	5.3 Infrastructure	46
	5.4 Management	48
	5.5 Performance	49
	5.6 Density	50

5.7	Transport	51
6	Results of the survey on husbandry practice on layer farms	53
6.1	Introduction	53
6.2	General information	53
6.3	Infrastructure	54
6.4	Management	56
6.5	Performance	57
6.6	Density	58
6.7	Transport	59
7	Results of the survey on husbandry practice on pig farms	60
7.1	Introduction	60
7.2	General information	60
7.3	Breeding stages	61
7.4	Finishing stages	63
8	Conclusions and discussion	67
8.1	Broiler sector	67
8.2	Layer sector	69
8.3	Pig sector	70
8.4	General conclusions	72
	References and websites	74
	Appendix	
1	Minutes of the Animal Welfare Workshop on 19 November 2009	76

Preface

Animal welfare is a major issue for the Ministry of Agriculture, Nature and Food Quality (LNV) in the Netherlands. Animal welfare is also an important international issue. However, a national effort can only be sustained if there is international acceptance. If international standards are implemented in other countries there will be a level playing field that is needed for fair international competition. Argentina is an important exporter of poultry meat and egg products. The pork production is small but has good opportunities because there are favourable conditions in Argentina. At this moment it is important to know more about the actual conditions in the poultry and pork sector, laws and regulations on animal welfare and the relevant institutions and actors in Argentina. For this reason, the agricultural counsellor of LNV in Argentina initiated this project to study the poultry and pig sector in Argentina.

This project was carried out by researchers of LEI in cooperation with a team of researchers of the School of Agronomy of the University of Buenos Aires (UBA). Overall project leader was Peter van Horne of LEI. Peter van Horne and Mariët de Winter visited Argentina in November 2009, visited some farms and attended the workshop. We want to thank the UBA team for the good cooperation and hospitality during their visit.

We thank the Ministry of LNV for financing this project and the Agricultural counselor F.L.M. Vossenaar for his support during this project. We hope this report gives some insight into the Argentinean poultry and pig sector and that this will be the basis for further improvements on animal welfare in the sector.



Prof. Dr R.B.M. Huirne
Director General LEI Wageningen UR

Summary

Animal welfare receives more legislative attention in the European Union (EU) than in many other regions of the world. Animal welfare standards for poultry and pigs are generally higher in the EU than in countries exporting to the EU. In this respect Argentina is an important country. The poultry and pig sector in Argentina possesses comparative advantages to produce at low production costs, which results in a high potential to globally become a major producer and supplier for poultry meat, egg products and pork.

The general objective of this study is to provide an overview of the current husbandry and management practices in the poultry and pig sector in Argentina related to animal welfare and to identify potential improvements for animal welfare at farm level and during transport. In order to become acquainted with the state of animal welfare in poultry and pig production in Argentina, the research centered around the following aspects: 1) description of the regulatory framework in force in Argentina with respect to animal welfare, 2) global description of each sector and 3) survey of husbandry practice in Argentina with special focus on animal welfare indicators in productive systems.

In Argentina there is no specific legislation on animal welfare. However, there is some legislation for related topics like food safety and product quality. For the broiler sector there are manuals on Good Practices for the Production that indirectly poses animal welfare criteria. According to the information collected through the survey and the interviews with producers and businessmen, in Argentina producers do not consciously implement animal welfare practices.

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

In all 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, and better conditions during transport.

For raising animal welfare to EU-standards in the layer and sow sectors an overall change in husbandry systems is necessary in Argentina. New housing systems (enriched cages or floor housing) have to be introduced for layers and group housing for sows. 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 Argentinean poultry and pig sector should actively approach the market (partners) and seek the dialogue and possibilities to sell high value animal welfare products.

Whether the Argentinean sector can use the 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 whether 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.

Samenvatting

Het welzijn van dieren krijgt binnen de Europese Unie (EU) meer aandacht dan in andere delen van de wereld. De standaarden voor de varkens- en pluimveesector liggen in de EU over het algemeen hoger dan in de landen die exporteren naar de EU. In dit opzicht speelt Argentinië een belangrijke rol. De varkens- en pluimveesector in Argentinië kan door een aantal comparatieve voordelen produceren met een lage kostprijs. Dit geeft het land de potentie om wereldwijd een belangrijke leverancier voor kippenvlees, eieren en varkensvlees te worden.

Het algemene doel van dit onderzoek is om een overzicht te kunnen geven van de huidige houderij en managementpraktijk in de varkens- en pluimveesector in Argentinië, gerelateerd aan dierenwelzijn, en om potentiële verbeteringen voor het dierenwelzijn op bedrijfsniveau en tijdens transport te kunnen identificeren. Om de huidige stand van zaken rond het dierenwelzijn in de varkens- en pluimveesector in Argentinië beter te verkennen, heeft dit onderzoek zich geconcentreerd op de volgende zaken: 1) een beschrijving van de huidige regelgeving met betrekking tot dierenwelzijn die in Argentinië van kracht is, 2) een algemene beschrijving van iedere sector, en 3) een overzicht van de houderij in Argentinië waarbij de aandacht uitgaat naar de indicatoren van dierenwelzijn bij productiesystemen.

In Argentinië bestaat geen specifieke wetgeving voor het welzijn van dieren. Er bestaat wel een wetgeving voor onderwerpen die eraan gerelateerd zijn, zoals voedselveiligheid en productkwaliteit. Voor de vleeskuikenindustrie bestaan er handleidingen voor 'Goede Landbouw Praktijk' die indirecte criteria bevatten voor dierenwelzijn. Volgens de informatie die via dit onderzoek is verzameld en interviews met producenten en verwerkers houden Argentijnse producenten zich niet bewust bezig met het welzijn van dieren.

Als wordt gekeken naar de huidige situatie op boerderijniveau, dan kan geconcludeerd worden dat er een groot verschil bestaat tussen de sectoren. De houderijomstandigheden die direct gerelateerd zijn aan dierenwelzijn zijn relatief goed voor vleeskuikens en mestvarkens. Voor leghennen en zeugen zijn de omstandigheden slechter dan de gemiddelde omstandigheden in EU-landen in Noordwest-Europa. Vooral voor leghennen ligt de gemiddelde oppervlakte per hen lager dan het EU-niveau en ver beneden het nieuwe niveau dat in 2012 zal worden toegepast.

Er kunnen in elke sector kleine veranderingen worden toegepast om het dierenwelzijn te verbeteren. Veel van deze veranderingen resulteren ook direct in financieel voordeel voor de boeren door een hogere productie en betere kwaliteit. Enkele voorbeelden hiervan zijn een lager sterftecijfer, betere ventilatie, betere omstandigheden vóór transport en tijdens het transport.

Om het dierenwelzijn op het niveau van de EU-standaard te krijgen in de leghennen- en zeugensector is er een algehele verandering nodig in de Argentijnse veeteeltsector. Er moeten nieuwe houderijsystemen (verrijkte kooien of grondhuisvesting) voor leghennen en groePHuisvesting van zeugen worden geïntroduceerd. Een verandering naar dit soort veeteelt zal een stijging in de kostprijs met zich meebrengen. En ondanks het feit dat deze maatregelen voor dierenwelzijn in Argentinië kunnen leiden tot hogere productiekosten, zijn deze kosten waarschijnlijk nog steeds lager dan de bijkomende kosten voor boeren in de EU vanwege de relatieve voordelen in landprijzen en loonkosten in Argentinië. Desondanks moeten de bijkomende kosten die de boeren dan maken, worden gecompenseerd door bijvoorbeeld hogere marktprijzen. Op dit moment bestaat er nog geen afzetmarkt in Argentinië voor de 'diervriendelijke producten', maar er is er wel een in het buitenland: de EU. De enige kans om een marktvoordeel te behalen voor de producten met toegevoegde waarde is om deze te exporteren naar de EU. Om deze kans te kunnen benutten moet de Argentijnse varkens- en pluimveesector de markt (partners) actief benaderen en de dialoog en mogelijkheden opzoeken om hoogwaardige, diervriendelijke producten te kunnen verkopen.

Of de Argentijnse sector de kansen kan benutten, zal deels afhangen van het overheidsbeleid. De onstabiele economie vormt een risico. Hierdoor is er weinig krediet te verkrijgen, is er een hoge rente en onzekerheid of de investering zichzelf wel terug kan verdienen. Een ander risico kan worden gezien in het uitvoerbelastingstelsel waarvan de uitvoertarieven snel veranderen doordat deze worden gebruikt als politiek instrument. Ten slotte is controle relevant als er wordt geëxporteerd naar de EU. Er zal dus een noodzaak bestaan voor een onafhankelijk bewakingssysteem om de productspecificaties van geëxporteerde goederen te kunnen garanderen.

1 Introduction

1.1 Problem statement

Animal welfare receives more legislative attention in the European Union (EU) than in many other regions of the world. Animal welfare standards for poultry are generally higher in the EU than in producing countries exporting to the EU, particularly developing countries. The action plan for animal welfare introduced by the European Commission aims to further expand the body of regulatory standards (European Commission, 2006). The EU position is partly induced by specific features of the production environment. In addition, EU policymakers claim that EU consumers have increasing preferences for the welfare of production animals. Consumer researchers have revealed a wide divergence in ambitions and motivations of private labels in the EU regarding animal welfare (Ingenbleek et al., 2007).

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

Argentina is an important producer of broiler meat and eggs ranking 9th and 25th worldwide. Since 2003, broiler production has more than quadrupled, and exports have exceeded imports, representing 16% of the total national production. For eggs both production and consumption have doubled since 2001. For dried egg products Argentina is one of the main exporters to the EU. For swine production Argentina is positioned as 20th producer worldwide. Currently, Argentina is a net importer of swine meat. For all three sectors Argentina possesses the comparative advantage to produce at low production costs, which results in a high potential to globally become a major meat producer and supplier.

1.2 Objectives

The general objective of the project is to provide an overview of the current husbandry and management practices in the poultry and pig sector in Argentina related to animal welfare. The project describes the current levels of welfare. It

also identifies potential improvements for animal welfare at farm level and during transport. In order to become acquainted with the state of animal welfare in poultry and pig production in Argentina, the research centered around the following aspects:

1. description of the regulatory framework in force in Argentina with respect to animal welfare;
2. global description of each sector;
3. survey of husbandry practice in Argentina with special focus on animal welfare indicators in productive systems.

1.3 Structure of the research

The project is a scoping study with network building and a first stock-taking as prime objective. As a result the Argentina counter partner in research played an active and important role in the project. A team of researchers of the University of Buenos Aires (UBA) investigated the situation in the broiler, layer and pig sector and described their findings in three sector reports. Each report gives an overview of the agribusiness sector and the current animal welfare situation with a focus on legislation and institutions. The main part of every report is the analysis of survey carried out in the sector. This was done by visiting several companies and farms in order to identify relevant parameters related to animal welfare. The questionnaire used for this survey was extensively discussed with the researchers of LEI. The findings of these three sector reports are included in this report. The project was finalised with a study tour to Argentina. During this trip a team of LEI and UBA visited some farms and the UBA reports were discussed. There was also a meeting with the Agricultural counselor during which the general situation for agriculture in Argentina was discussed. The last day LEI and UBA organised a workshop in which the results of the research of both institutes were presented and discussed with some representatives of the agricultural sector in Argentina. Appendix 1 of this report gives the minutes of the workshop.

1.4 Structure of the report

In chapter 2 a short overview is given of the Argentinean economy and the governmental policy concerning agriculture. Chapter 3 gives a description of the poultry and pig sector in Argentina. Chapter 4 examines the current Animal Wel-

fare scene in Argentina with a description of the legislation on animal welfare and the main public and private institutions. Chapter 5, 6 and 7 give the results of the survey on husbandry practice on broiler, layer and pig farms. Chapter 8 gives the main conclusions and discussion.

2 Argentinean economy and governmental policy

2.1 General

With 3.761m km², Argentina is the second largest country in South America. The capital is Buenos Aires. In 2009 Argentina had just over 40m inhabitants, with an annual population growth of 375,000 people. With its 3,700km from north to south, Argentina stretches from the Arctic Circle to the subtropics. From east to west, Argentina stretches for 1,400km from the Andes to the Atlantic Ocean (figure 2.1). The landscape consist of the mountains of the Andes in the West, the highland plains of Pathagonia in the South, the desert-like forested areas of the Gran Chaco in the North, and the lowland plains of the Pampa in Central Argentina. The majority of economic activities are in the Pampa. The Pampa is a grassland area with a semi-arid steppe climate with summer temperatures of over 30°C and cool winters, an annual rainfall of 200-250mm, and 2,600 hours of sunshine per year.

2.2 Economy and currency

Argentina suffered during most of the 20th century from recurring economic crises, persistent fiscal and current account deficits, high inflation, mounting external debt, and capital flight (WFB, 2009). The agricultural sector has played a crucial role in getting the economy back on its feet. Following the devaluation of the peso in 2001/2002, exports were booming. This quickly generated fear of rising prices on the domestic market. From 2005 onwards, the government started to intervene to ensure abundant and cheap supply of food products, exports were subject to licences or halted, export taxes became more important and more and more prices were set. Export tariffs have now become a main component of the government income, with soy bringing in the most. The official inflation rate was about 8% in the past few years, but all private sources indicate that real inflation was a least twice as high.

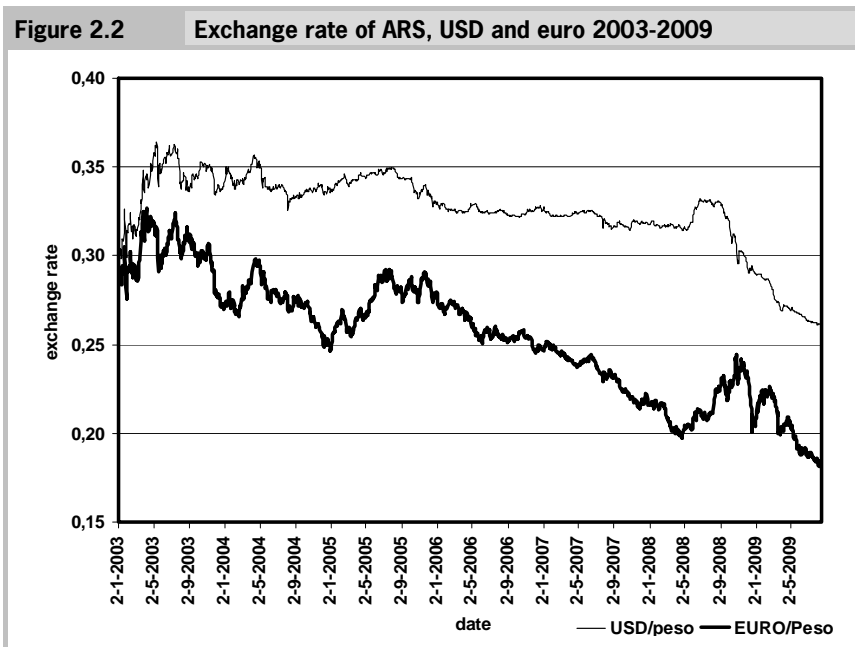
Figure 2.1 Map of Argentina



In 2008, the Gross National Product per capita was around ARS9,500 or 7% of the average Gross Domestic Product (GDP) of €25,000 in the EU. The share of primary agriculture in the countries' GDP was 9.9%, whereas agriculture used only 1% the labour force (WFB, 2009), showing a high labour performance in the agricultural sector. The processing industry has to be added to this figure. The country is an exporter of agricultural commodities (soy, wheat, maize), fruit (lemon, apples), meat (mainly beef) and wine.

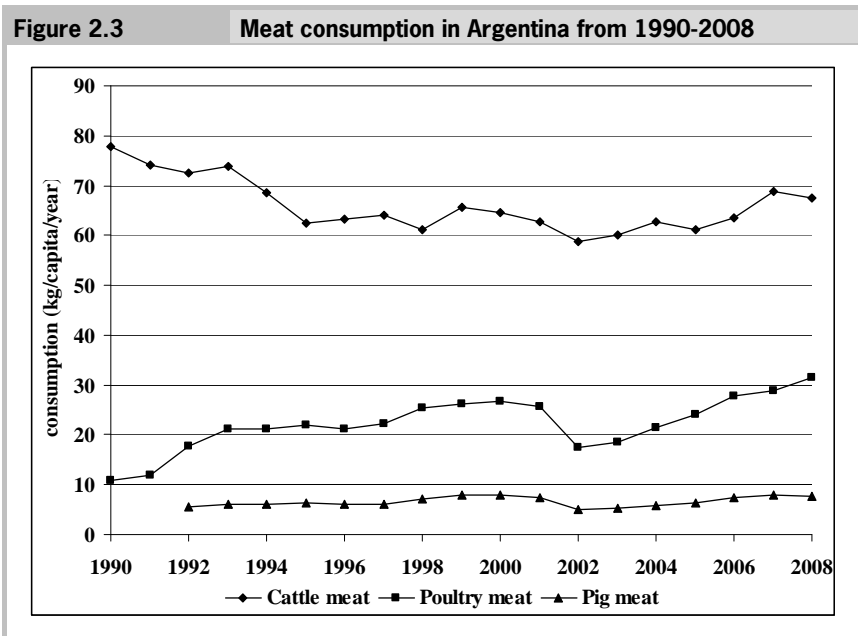
Currency

The national currency is the Argentinean Peso (ARS). The ARS has been steadily dropping against both the USD and the euro (figure 2.2). In August 2009, one ARS equalled USD0.26 and €0.18. The currency is weakening, due to strong inflation, resulting in an increasing exchange rate compared to the euro. The commercial bank prime lending rate in November 2008 was 28%.



2.3 Meat consumption

Total meat consumption with 100-110 kg per capita is high in Argentina (EU around 90 kg per capita). Cattle meat consumption is very high (figure 2.3), although it has dropped from around 75 kg/capita in 1990 (75% of total meat consumption) to around 65 kg in 2008 (65%). It should be noted that this still is about 4 times higher than the EU cattle meat consumption per capita. In contrast, poultry meat consumption has increased from 11 kg in 1990 (10%) to 30 kg in 2008 (30%) and pig meat consumption from under 6 kg in 1992 (5%) to 8 kg in 2008 (8%). Pig meat consumption is low compared to the EU level of around 40 kg/capita/year. In 2005, in line with food and beverage sales, about 40% of meat sales were in supermarkets and hypermarkets and the rest in traditional specialised stores (USDA FAS, 2005).



2.4 Governmental regulation of the meat sector

Argentinean animal production in the last years has been influenced greatly by the Argentinean export regime and market interventions. A few years ago, the

export regime stimulated large cattle meat exports. But currently, the export regime focuses on lowering the inflation rate. Because beef prices make up 4.5% of the Consumer Price Index in Argentina, the Argentinean government aims to reduce the inflation rate by setting prices all throughout the chain for the popular cuts, by applying export taxes on cattle meat and by using export licences. The government interference in the market complicates a long term stable development and many cattle farmers have ended their business. Beef supply therefore will not allow the same consumption levels in the near future, leaving an opportunity for increasing poultry and pork consumption. In comparison, pig meat and poultry meat face no interventions and have an export tax of 5%. The main reason for this discrepancy is that these products weigh less in the inflation index and that the companies make sure they will not raise prices beyond the inflation targets of the government. Intentionally or not, the market-policies stimulate pig and poultry production.

2.5 Feed

Argentina produces large amounts of raw materials for compound feed as soy beans and corn, with the possibility to even increase production. Argentina is the world's third largest soy bean producer with around 52m tonnes in 2008/09. Argentina is the largest exporter of soy meal and soy oil. The export taxes for soy meal and oil are 32% and 35% for beans. Almost 95% of the production is exported. Argentina is the world's fourth largest producer of corn with around 24m tonnes in 2007/08. However, in 2009/2010 the harvest of corn will be much lower. The export tax on corn is 20% and on wheat 23%. In a short period of time Argentina has become one of the world's leading bio-diesel producers and exporters with soy oil as the feedstock. Annual production was 2.4m tonnes in 2009. The export tax difference between soy oil and bio-diesel explains the rapid increase in bio-diesel export. Bio-ethanol made of sugar cane is just starting and the capacity was 45,000 tonnes at the end of 2009. Byproducts of biofuel production as DDGS can be used as animal feed.

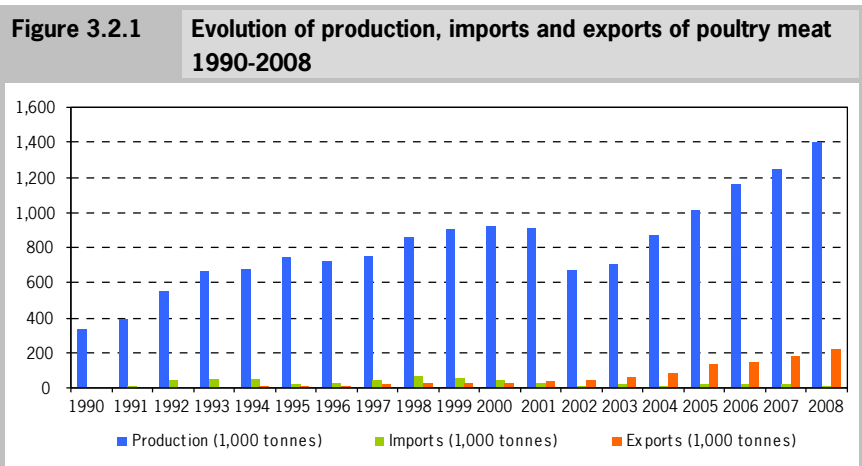
3 Description of the Argentinean poultry and pig sector

3.1 Introduction

In this chapter the poultry and pig sector in Argentina are described. For every sector main indicators and quantitative information are given.

3.2 Broiler sector

At present, Argentina is positioned as the 9th producer of poultry meat, with 1,425,000 tonnes in 2009, which is 2.0% of the total world production. In comparison, the United States, China, Brazil and the EU together account for about 67% of world production. Figure 3.2.1 shows that poultry meat production in Argentina has maintained a steady growth, except for a setback in 2002 as result of the economic crisis. Production has more than quadrupled from 1990 to 2008. Since 2002 exports exceed imports. In 2008 exports represented 16% of the total production.



In Argentina, broiler production activity is framed within Decree 1343/1996, which creates and defines the functions of the ONCCA, the National Office for Agricultural Commerce Control, which is responsible for controlling compliance with the commercialisation norms of the agricultural sector. From the sanitary standpoint, the productive chain is supervised by SENASA, the National Food Safety and Quality Service. SENASA also grants permits and conducts health inspections of those plants authorised for federal traffic and export.

Over the last three decades the broiler sector has experienced important transformations. During the 1970s, it advanced in technological development which reduced its fixed and variable costs. In the 1990s, a re-engineering process took place within the business design, and investments in process and product assets increased, making it possible to venture into the world broiler business. Broiler farmers are grouped in a private chambers CAPIA and integrators in a private chamber CEPA, In 2000, CAPIA and CEPA started working on medium and long term strategic aspects for the entire sector, signing a strategic plan in 2003. The most important aspects in this plan were (Palau et al., 2007):

a. *Enabling fresh and cut-up broiler exports*

In order to make broiler exports possible, processing plants had to improve their quality and food safety. Institutional support was obtained to finance the industry. At present, 50% of the plants are enabled for export.

b. *Protecting the Argentine broiler industry against dumping actions of the Brazilian poultry industry*

During 2000 the integrators grouped in CEPA requested from the national government anti-dumping measures against the Brazilian poultry industry, generating a ban on the entrance of parent lines, fertile eggs and chicks from Brazil into Argentina.

c. *Improving health conditions of the Argentine broiler industry*

The sector and government worked together to eradicate two main avian diseases, Newcastle disease and Avian Influenza, and the establishment of a free status regarding both of them.

At present, broiler farming and slaughtering/processing are almost completely vertically coordinated. Through contracts, the industry in most cases delivers day-old chicks, feed and professional advice to the producers, who contribute the facilities and labour. Then, producers deliver the broilers to the industry, which also commercialises the final product meat.

Supplies, Equipment and Services

In the present design of the business the integrators also provide broiler farmers with technical advice. Integrators thus promoted the introduction of technology on farms. Integrators purchased technology (genetics, equipment) and developed finance plans for the producers. The farmer provides the poultry houses, the labour, electricity and heating. At the end of each production cycle, the integrator discounts the money owed for the purchase of inputs from its payment to the broiler farmer.

The main breeds used are Arbor Acres, Cobb, Hubbard/Peterson and Ross. The basic reproduction material is mostly imported from the US and Europe. The final stages of the productive process, which include reproduction and incubation, take place in Argentina. In 2009, there were 298 reproductive farms and 80 hatcheries. Transportation of supplies to the farm, as well as pickup of the live birds after fattening and transportation to the slaughterhouse, is handled by the integrators using own or third party trucks.

Broiler production

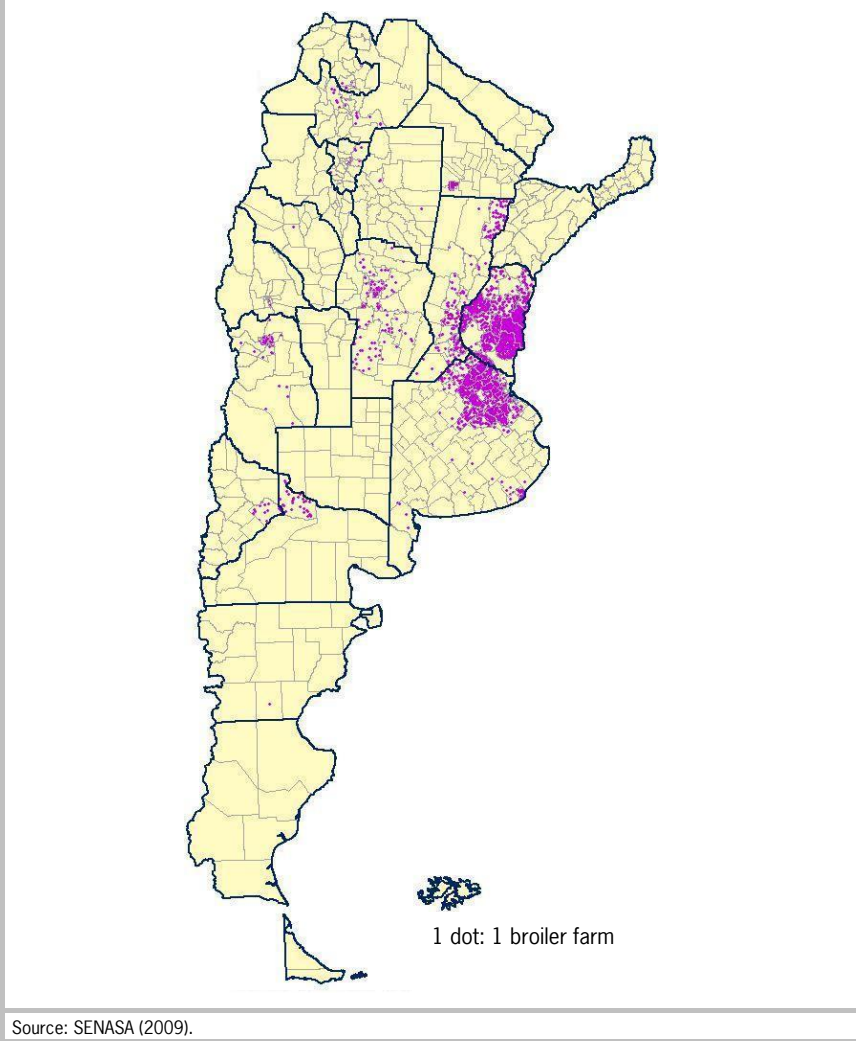
In 2009, Argentina had 3,926 broiler farmers. The province of Entre Ríos concentrates 56.5% of the farms, followed by the province of Buenos Aires.

Qualified informants interviewed in this work indicated that average farm size has been increasing in the last few years with the growth of the activity. Around 20% of the farms have an installed capacity lower than 10,000 broilers per cycle, 55% between 10,000 and 20,000 broilers per cycle, and 25% over 20,000 broilers per cycle. Current technological improvements are oriented at farm automation, ventilation and humidification systems for the poultry houses, greater roof insulation by means of different types of ceilings, and the use of automatic feeders. This tendency towards modernisation is promoted mainly by the integrators, which next to financing these improvements on contracted farms, also established certain technological standards as a requirement for those producers who wish to enter the production system they coordinate.

Slaughter and Industrialisation

Broiler slaughter plants are mainly located in the provinces of Entre Ríos and Buenos Aires, which concentrate almost 88%. The remaining 12% is shared by Santa Fe, Córdoba and Río Negro. During 2008, 48 broiler slaughtering plants were in operation. Of slaughtered birds, 58% is concentrated in 7 plants that slaughter over 1.5m heads a month. Among the leading companies are Grupo Rasic, Granja Tres Arroyos, Soychú, Las Camelias and FEPASA.

Figure 3.2.2 Geographical distribution of broiler farms in Argentina, 2009



Domestic Consumption

Total consumption of broiler meat in Argentina has grown in the past 10 years, from 792,000 tonnes in 1997 to 1,254,000 tonnes in 2008, with a drop in 2002 due to the crisis already mentioned. From 2007 to 2008, broiler meat consumption has shown an increase of 8.7%, Consumption in 2008 was 31.5 kg per capita per year, and CEPA estimates that it will reach 34 kg per capita in

2015. Growth of broiler meat consumption was supported by a favourable price relation to beef and pork. Since 2004, the beef/broiler meat price relation has increased from 1.76 to 2.04. In addition, it has been stimulated by changes in eating habits and lifestyle, characterised by an increased preference for white meats for dietary or nutritional reasons and a reduction of the time dedicated to the preparation of meals.

Foreign Trade

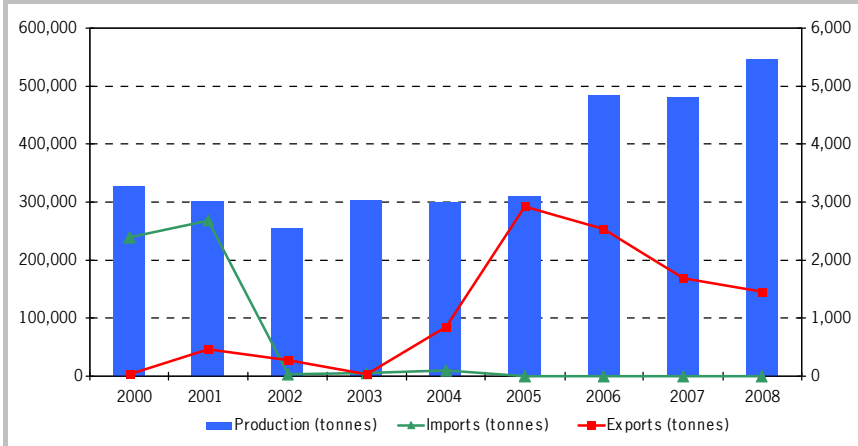
Since 2002 Argentina has become an exporter of broiler meat, with it currently ranking seventh in the world among exporters. In terms of exported volumes, however, Argentina's participation represents only 1.4% of the amount commercialised worldwide. Regarding the products exported, whole birds represented 40% of the exported volume, followed by other edible products (bouillons, backs, powdered cooked meat, etc.) representing 21% of the volume. The exported product of highest average value per tonnes in 2008 was the breast meat. The main destination, Chile, represents 21% in volume and 16% in value, followed by China, with 11% in volume and 9% in value. Of the exports, 59% in terms of value and 49% in volume is exported to 88 countries. Of the five main destinations for poultry and by-products, Germany represents the highest FOB value per tonne, USD3,020. It is worth mentioning that in 2008 Venezuela, historically not an important buyer, became the main market for exports of fresh broiler meat with 22.2% of the volume of exports.

Poultry imports in 2008 represented 0.9% of the estimated national production. The main origin of imports was Brazil. The main products imported were non-edible products (flours for animal feed, cartilage, other).

3.3 Layer sector

Commercial egg production in Argentina is a 40-year old business, and it was relatively stable until the mid-90s, when the sector started growing. Currently, it is estimated that the number of layers in production in the country is about 33m. During the year 2008, Argentina produced 8.766bn hen eggs in shell (about 548,000 tonnes). This represents a 67.6% increase during the 2000-2008 period (figure 3.3.1), and even more than a 100% increase since 1994 (SAGPyA, 2009).

Figure 3.3.1 Argentine egg in shell production (in tonnes on the left axis), imports and exports (in tonnes on the right axis)



In Argentina, most of the commercial egg producers are members of CAPIA (Argentine Chamber of Poultry Farmers). The strategic plan that was developed in 2003 for the poultry agribusiness system, although it is mostly focused on poultry meat, also has some key issues for egg production. These include sanitary matters like the eradication of Newcastle Disease and Avian Influenza, of which the country is currently free.

Both production and domestic consumption of eggs have almost doubled since 2001. Of total Argentinean egg production of 2008, over 11% (974m eggs) was consumed by the industry. Just 11 companies are licensed by SENASA to industrialise eggs, of which 4 companies (Tecnovo, Ovoprot, Las Acacias and Compañía Avícola) concentrate 80% of total industrialisation. The remaining 7.72 billion eggs were sold domestically through various formal and informal channels, including wholesalers, supermarkets, minimarts, direct sales to end users (consumers), local and regional small retailers. Although at the beginning of the decade some imports of eggs occurred, currently they are practically inexistent. Exports have grown over the same period of time.

Organisation of the sector

Characterising the egg producing primary sector is difficult due to lack of official data (the last census took place in 2002). But, data provided by official entities and producers associations allow for estimation of approximate figures that portray a general overlook of this sector. Egg production in Argentina is heterogeneous, with variations in scale of production, technology and formality levels.

It is regulated by SENASA through regulation number 614/97. SENASA extends licences and controls every licensed farm.

Nevertheless, a large amount of layer operations that are not licensed and/or operate on informal channels of distribution exist. Currently, around 35-40% of the eggs still are produced with 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 a great deal of fiscal and sanitary informality exists. The outlets for these products are usually self-consumption, direct sales to consumers, and local and regional small retailers and fairs.

On the other hand, around 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. The outlets for eggs coming from these producers are typically formal wholesalers and retailers and the processing industry. Direct sale to consumers is improbable.

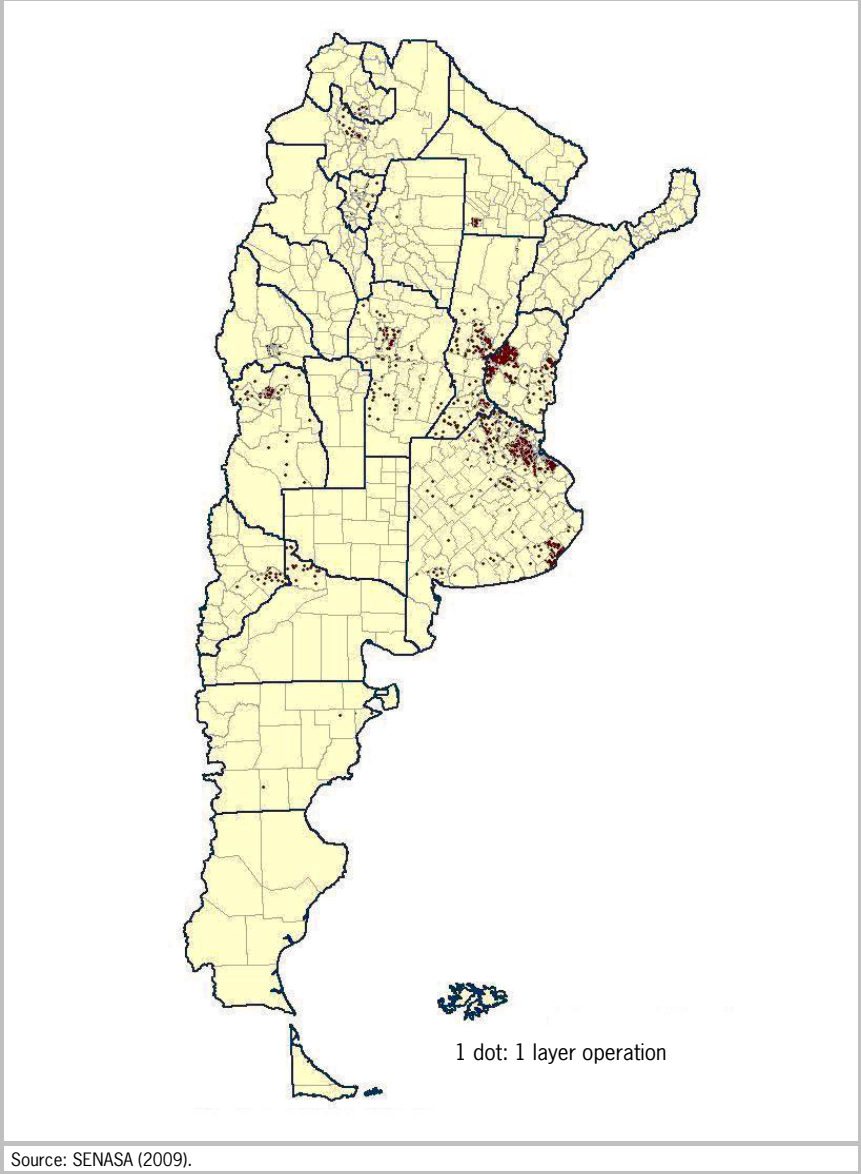
Currently, production is done by companies, in which the farmer owns the inputs, the poultry houses and the eggs produced. Unlike the situation in broiler production little production contracts exist. Typically, large scale producers have their own pullet rearing facilities, mostly in a separate farm, due to health reasons. 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 the central region of the country. The provinces of Buenos Aires, Entre Ríos, Santa Fé, Córdoba and Mendoza account for about 89% of the total number of operations across the country, with Buenos Aires and Entre Ríos alone accounting for almost 64%. The geographical distribution of the layer operations can be observed in figure 3.3.2.

Domestic consumption

Argentina's egg consumption has grown steadily over the last 10 years from 120 eggs/capita/year at the end of the 90s to almost 217 eggs/capita in 2008. Argentina is currently at record levels of egg consumption, although in comparison with the developed countries there is still room for growth.

Figure 3.3.2 Geographic distribution of layer operations in Argentina, 2009



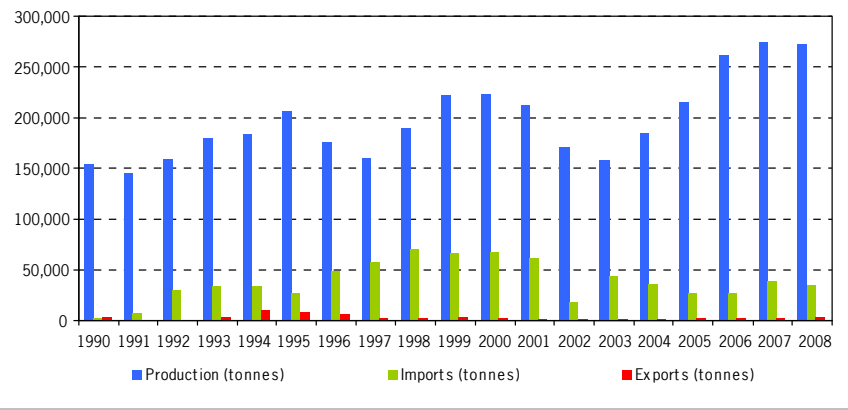
Foreign Trade

Export in the Argentine egg sector is not of great importance, as practically 99% of production is consumed domestically. Nevertheless, Argentina has shifted from importing eggs and egg products at the beginning of the decade to exporting them presently with over 2,000 tonnes of eggs in shell and over 2,500 tonnes of processed egg products. This makes Argentina the 15th world exporter of egg products. In terms of egg products, Argentina exports 2,300 tonnes of dried egg and over 250 tonnes of liquid egg and in terms of component, the country exported 1,578 tonnes of yolk products and 970 tonnes of albumen products during 2008. In terms of value, processed egg products added up to USD14.6m, while eggs in shell's export value was USD9.7m. Argentina's main destinations for industrialised egg products are Angola (22%), Austria (22%), Russia (11%) and Belgium (8%). Argentine imports of eggs and egg products are extremely low.

3.4 Pig sector

Argentina is positioned as the 20th producer worldwide, with a share of 0.22% of the total world production. In the 1980s, swine production started a modernisation stage that reached its most important peak during the 1990s. Trough intensification of production systems and genetic and nutritional improvements were carried through, reproductive rates improved, greater productive efficiency was obtained, and better products according to consumer needs were developed. In some cases, the organisation of the productive-commercial chain was also modified as feed producers integrated forward into primary production. In the large businesses vertical integration from primary producers investing in slaughter plants was also observed. Important investments were made in infrastructure, facilities and confinement equipment that noticeably improved productivity levels. Figure 3.4.1 shows that from 1990 to 2008 pig meat production in Argentina increased by 77%. However, at present production does not satisfy domestic demand and Argentina is still a net importer of pig meat.

Figure 3.4.1 Evolution of production, imports and exports of pig meat 1990-2008

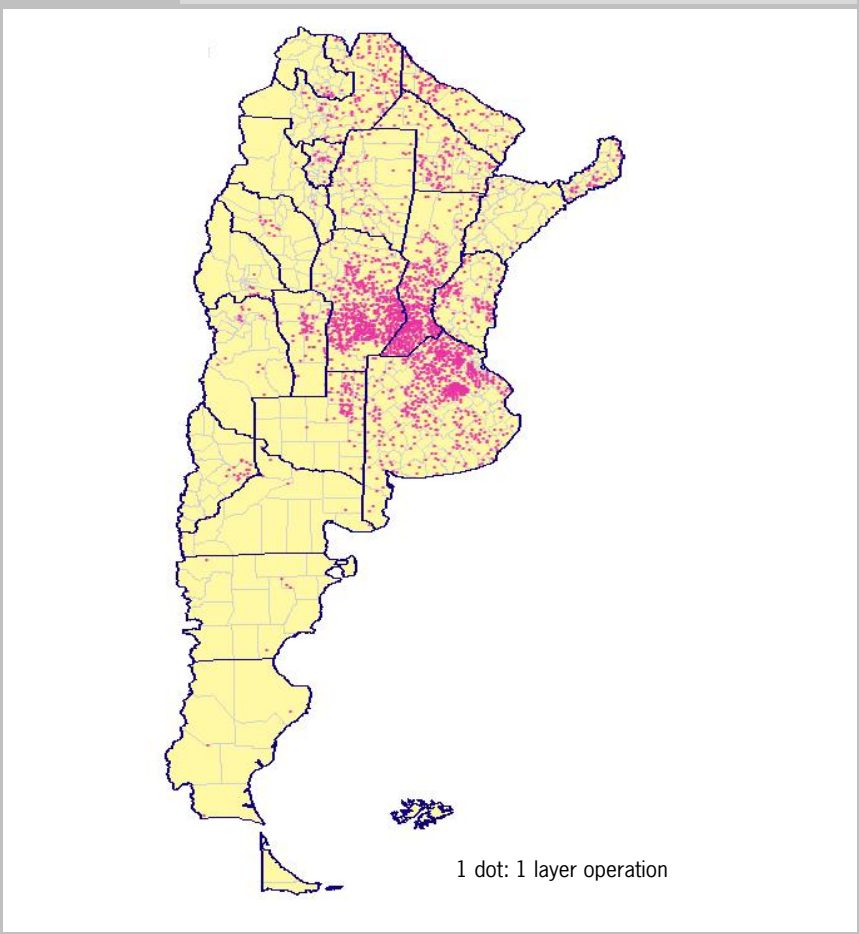


Producers

The characterisation of the swine primary sector is difficult due to lack of official data (the last census data are from 2002). But, data supplied by SENASA on vaccination programmes can be used to estimate the current numbers of pigs and of producers. On 31 March 2009, total pig livestock was estimated at just over 3m, mainly present in the provinces of Córdoba, Buenos Aires and Santa Fe (figure 3.4.1).

In March 2009 there were 56,179 producing farms (table 3.4.2). Pig production farms are heterogeneous in production scales and systems. About 81% of Argentine pig producers have fewer than 10 sows with 22.4% of sows. Less than 5% of the producers own more than 50 sows and have almost 50% of all sows. The national average number of sows per producer is 12.0, varying between 3.3 and 1,629.2 between small and large farms. This heterogeneity among pig producers can be explained by three reasons: 1) pig production was historically done extensively and as a 'byproduct' of other agricultural activities as dairy farming; 2) different productive systems for pig production exist: pasture or open air systems, confinement systems, and systems that combine categories of animals raised in one system and categories raised in another; and 3) differences in the design of facilities and in feeding management and genetics.

Figure 3.4.2 Geographical distribution of swine livestock in Argentina, 2009



Source: SENASA (2009).

Table 3.4.1	Existing producers by scale, according to the quantity of sows they own in 2009					
	Average number of sows per farm					
	≤10	11-50	51-100	101-500	≥500	Total
Producers	45,408	8,717	1,289	702	63	56,179
% Producers	80.8%	15.5%	2.3%	1.2%	0.1%	100,0%
Sows	151,078	200,706	91,736	129,107	102,641	675,268
% Sows	22.4%	29.7%	13.6%	19.1%	15.2%	100.00%
Sows/producer	3.3	23.0	71.2	183.9	1,629.2	12.0

Pig producers can be classified in five categories according to the number of sows (Grosz, 2007):

1. *Fewer than 10 sows*

Subsistence production, for self-consumption and home production of cold meats, generally for end-of-year festivities. Pig farming complements other agricultural and farm activities. Generally open field system and usage of family labour. These farms supplement their herds based on feed prices, have minimum health care plans and low levels of genetic improvement of their stocks.

2. *Between 10 and 50 sows*

Commercial breeding farms, generally extensive (pasture), which eventually confine the maternity stage. Predominantly family labour. They are often combined with other activities, such as agriculture.

3. *Between 50 and 100 sows*

Usually production both in the open air and in confinement. In general, these systems are characterised by scarce or no development of business management.

4. *Farms with over 100 sows*

Comprises all stages of the productive cycle and have advanced genetics, health care plans, feeding based on balanced feed, and good management practices.

5. *Over 500 sows*

Sophisticated and efficient breeding farms that comprise all the stages of the productive cycle and have advanced genetics, health care plans, feeding based on balanced feed, and good management practices.

The first two categories produce on average 14-15 piglets/sow/year, whereas the last two categories around 20 piglets/sow/year (Grosz, 2007).

The quality and slaughter performance of pigs from small farms is of lower than those produced in large farms (Grosz, 2007). Health and fiscal controls on small farms are weak due to informality.

Slaughtering and processing plants

Pig slaughter plants can be categorised according to their degree of complexity of the tasks they perform (cycle 1: slaughter; cycle 2: cutting up; complete cycle), the type of business they constitute (provide services to third parties or not) and degree of official transit authorisation they have (local, provincial, national, export). According to ONCCA, pig slaughtering plants can be classified as follows:

1. *Swine meat processing plant*
A slaughterhouse that has refrigerating chambers on the premises and which can carry out manufacture and industrialisation functions.
2. *Municipal slaughterhouse*
A slaughterhouse without refrigerating chambers in which the Municipality is responsible for the operation, and which exclusively performs services for third parties.
3. *Rural slaughterhouse*
A slaughterhouse that has provincial health approval but does not have refrigerating chambers, as long as slaughter/suppliers¹ do not operate in it and the product of slaughter is destined exclusively to supply the municipal jurisdiction in which it operates. Slaughter numbers may not exceed fifteen bovines and/or thirty sheep and/or swine and/or goats.

According to ONCCA, 171 registered pig slaughtering plants exist, of which 33% is approved by SENASA. Most of the plants (85%) belong to category 1, Swine Meat Processing Plants. In 2008, 3.15m pigs were slaughtered. The location of the slaughter is linked to the availability of live pigs, and is concentrated in the provinces of Buenos Aires, Córdoba and Santa Fe. Slaughtering plants that slaughter fewer than 1,000 pigs per month are predominant (74,15%). Only 4 plants slaughter over 10,000 pigs per month.

¹ The slaughter/supplier is an organisation that buys pigs in the market, slaughters at a plant that does not belong to him, and later distributes the product in his network of retail points of sale, commonly belonging to third parties, although he may also own some points of sale himself.

Commercialisation

It is estimated that about 90% of the production is commercialised directly to the processing plant, based on a reference price that is often not very clear (Senesi et al., 2008). The price agreed upon depends a lot on the local market price. The Swine Cattle Classification System based on lean tissue content has been in force since 1995. This system seeks to optimise the quality of meat produced for the industry, whose purpose is to improve the price formation mechanism. The average percentage of lean meat went from 41,72% in 1995 to 47,3% in 2008. However, in 2008 only 58% of the swine slaughter was classified.

There are no supply contracts or future price contracts. In turn, there are actors who act as intermediaries. In 2008 there 334 were slaughter/suppliers and 3 direct consignment dealers registered with ONCCA. Direct consignment dealers perform a similar function as slaughter/suppliers but operate solely on behalf and to the order of the sender.

Cold meat and salting industry

There are 354 factories in the country, mainly in the City of Buenos Aires and the provinces of Buenos Aires, Santa Fe and Córdoba (ONCCA, 2008). Of these factories, 47% are registered by SENASA. Plants that are not registered do not have authorisation for inter-provincial transit or exports. Of the cold meat and salting factories, 95% are small enterprises (SMEs) who operate informally. The largest 5% produce 70% of the total production.

The manufacture of cold meats and sausages absorbs 85% of national pork production. The nationally installed capacity is estimated at 465,000 tonnes per year, with a utilisation level of approximately 84%. The products of the cold meats and/or salting industry can be grouped in [1] cold meats -pressed and not pressed- and [2] salted products - cooked or dried-. Cooked salted products and cooked pressed meats (like hotdogs) are the most relevant products with 68% of total production.

Foreign trade

In 2008, imports of pig meat products and byproducts were 35,131 tonnes with a value of USD91m. Of this volume, fresh meats represented 71% with a value of USD70m and is destined mainly to the cold meats industry. The main origins for fresh meats import were Brazil (80%), Chile (11%) and Denmark (7%). The main imported products were ham (39%), shoulder (15%), and bacon (20%). Cold meat imports in 2008 mainly consisted of cooked ham (44%) and cured

ham (19%) with a value of USD7m. Origins of imports were Brazil (87%), Italy (11%) and Spain (2%).

Exports of pig meat products and byproducts are not significant with 3,638 tonnes in 2008. Trimmings and viscera were the main export products with 33% of the total volume. The main destination was Hong Kong (78% of export volume). The second exported product was fresh meat, with 20% of the exported volume. The main destinations were Georgia and Hong Kong.

Consumption

In Argentina, average annual pork consumption was 7.7 kg per capita in 2008. This is half the average world consumption of 16.5 kg/capita/year, one fifth of the consumption in developed countries (35-40 kg/capita/year), and even less than the consumption in developing countries (12 kg/capita/year). For example, per capita Europeans consume almost 42 kg of pork, 16.5 kg of beef and 22.0 kg of poultry meat (PVE, 2009). Low pig meat consumption can partly be explained by the strong tradition of beef consumption in Argentina, which in 2008 reached 65.5 kg per capita. Next in importance is poultry meat, with a consumption level of 32 kg per capita in that same year. At present, pig meat consumption comprises approximately 85% cold meats and salted products and 15% fresh pig meat. Fresh pig meat consumption peaks in the last trimester of the year due to the demand for suckling pigs for Christmas and New Year festivities.

4 Legislation and institutions on animal welfare

4.1 Introduction

Animal welfare was identified as one of the priorities of the World Organisation for Animal Health (OIE) with objectives and actions within the Strategic Plan for the period 2001-2005. The definition of animal welfare includes how individual animals cope with their environment including their health, their perceptions, their mental state, and other positive or negative effects that influence the physical and psychological mechanisms of an animal.

In Latin America the development of legislation regarding animal welfare is low compared to that of regions such as the EU, although large differences exist between individual countries. In Costa Rica there has been an animal welfare law since 1994, but in Colombia and Cuba preliminary draft laws are just in the process of being approved. However, in most Latin American countries no specific animal welfare law exists, although there are laws and manuals related to some aspects of animal welfare (Estol, 2007). In general, the production aspects related to animal welfare are voluntary. According to Rojas (2005) the adoption of animal welfare principles and regulations in Latin American countries is generally directly related to the possibility of and interest in exporting. Demands for export to the EU and other markets include the aspects of animal welfare during production, transportation and slaughter.

4.2 Legislation and institutions for animal welfare in Argentina

Argentina has promulgated partial legislation not directly related to animal welfare, but to connected topics. However, public and private institutions oriented towards animal welfare have published guidelines and reference manuals for implementation of animal welfare. Argentinean institutions directly involved in animal welfare have adopted the definition of animal welfare proposed by OIE. Additionally, SENASA includes in the definition 'the set of measures taken to diminish the animal's tension, suffering, trauma and pain during its transfer, exhibition, quarantine, commercialisation, exploitation, training and slaughter'

(SENASA, 2004). The five general criteria of animal welfare practices in Argentina are (Figuroa, 2008):

1. The animal must be free from hunger, thirst and malnutrition;
2. The animal must be free from fear and distress;
3. The animal must be free from physical and thermal discomfort;
4. The animal must be free from pain, injury or disease;
5. The animal must be able to express normal behaviour.

Table 4.1 lists the National and Provincial Legislation related to animal welfare. Table 4.2 lists documents published by public institutions that serve as an institutional framework.

Table 4.1 National and Provincial Legislation related to animal welfare in Argentina	
National Legislation	Observations
Health Policing Law No. 3959 dated 1889-1919	Refers to treatment of sick animals, presenting measures to prevent propagation of contagious diseases nationally and through foreign trade (imports and exports). It establishes that animal transportation must be performed under conditions of comfort, safety and hygiene, and sets fines and penalties for non-compliance.
Law No. 14.346 dated 1954	A penal animal protection law imposing penalties on acts of ill-treatment or cruelty. The following are considered acts of ill-treatment: <ol style="list-style-type: none"> 1. Not feeding domestic or captive animals with sufficient quality and quantity of feed; 2. Prodding working animals by means of instruments that, beyond simple stimulation, will cause unnecessary punishment and feelings of pain; 3. Making animals work excessively long hours without proper rest according to the season; 4. Making animals work while not physically fit to do so. 5. Stimulating animals with drugs not for therapeutic reasons; 6. Employing animals to pull vehicles that notoriously exceed their capabilities.

Table 4.1 National and Provincial Legislation related to animal welfare in Argentina (continued)

National Legislation	Observations
	<p>The following are considered acts of cruelty:</p> <ol style="list-style-type: none"> 1. Practicing vivisection for scientifically indemonstrable ends and in places or by people not properly authorised for that function; 2. Mutilating any part of the body of an animal, except when the object of the act is improvement, branding or hygiene of the respective animal species or when the act is performed for merciful reasons; 3. Performing surgery on animals without anesthesia and without qualifications as a medical or veterinary doctor, for reasons other than therapeutic or for technical operating training, except in case of a properly proven emergency; 4. Experimenting with animals of a higher grade in the zoological scale than it is indispensable according to the nature of the experience; 5. Abandoning animals used in experiments to their own resources; 6. Causing the death of pregnant animals when such a state is noticeable in such animals, except in the case of legally established industries based on exploitation of unborn fetuses; 7. Intentionally injuring and running over animals, torturing them or causing them unnecessary suffering, or killing them just out of perversity; 8. Performing public or private acts of animal fighting, bull-fights, and parodies in which animals are killed, injured or harassed.

Table 4.1 National and Provincial Legislation related to animal welfare in Argentina (continued)

National Legislation	Observations
Law N° 17.160 dated 1967	This Law modifies Law 3959 and delegates to the State Secretariat of Agriculture and Livestock everything related to authorisation, integral health supervision and inspection in livestock markets, fairs, slaughterhouses, processing plants, salting houses, and plants where products of animal origin are manufactured or stored, or where animals are sold or slaughtered, corresponding to the federal jurisdiction and international commerce.
Law N° 18.819 dated 1970 Euthanasia	It prohibits the use of the bolt pistol for the slaughter of bovines, equines, swine and goats slaughtered in the slaughterhouses or processing plants in the country.
Decree 206 dated 2001 National Program of Organic Production - includes swine and poultry - Secretariat of Agriculture, Livestock, Fisheries and Food	States that 'animal welfare guidelines shall be respected' (making reference to behaviour guidelines, appropriate densities, etc.). Emphasises providing good quality feed, organically produced, keeping suitable cattle densities, applying cattle-raising systems adapted to behaviour needs and adopting cattle handling practices that minimise stress and promote animal health and welfare, preventing diseases and avoiding the use of chemical veterinary medicines. Animals must be treated according to the rules of animal welfare and protection during loading, unloading, transportation, penning and slaughter.
National Registry of Means of Transportation 1999 - SENASA Resolution 97 dated 1999	Provides demands on certain characteristics in the design and construction of the vehicles to facilitate safe, hygienic and comfortable loading and unloading of animals for their transportation.
Resolution N° 16/96-GMS-MERCOSUR	Approves norms for animal transit and considers the design and materials of the trucks so that they can be washed, disinfected and disinfested and support the weight of the animals, guaranteeing their safety and welfare. Service Order 02/04 stipulates that the Procedure Manual on Animal Welfare be followed.
Provincial Legislation	Observations
Law of the Province of La Pampa N° 1989/2003	Stipulates respect for the principles of animal welfare, including slaughter. Establishes the (voluntary) certification of 'natural meat' and includes in its protocol the observation of animal welfare.

Table 4.2 **Guides, documents and reference manuals on animal welfare**

Document	Observations
Conduct Guidelines in accordance with Community Directive 93/119 of Spain - Mission Report 7887/2008 - SENASA	Compulsory decree for export to the EU. It considers insuring compliance with EU regulations on animal welfare at the time of slaughter in all processing plants authorised to export.
State of the Art of Animal Welfare in Argentina, 2008 - INTA	Document that describes the animal welfare situation in different links of the production chain of beef, pork and poultry, among others, in Argentina; shows the result of surveys conducted within the production, transportation, processing industry and consumption links. Finally, it performs a SWOT analysis.
Procedure Manual on Animal Welfare, 2004 SENASA	Describes basic procedures to bear in mind for the protection of animals. It promotes humane treatment of animals and advertises the norms that punish ill-treatment of animals, encouraging responsible attitudes towards animals in the community. The manual applies to bovine and ovine cattle, swine and poultry, among others. The Manual's practices of animal welfare cover transfer, stabling, restraint, loading, transportation, and health or veterinary practices developed on bred or maintained livestock, as well as for slaughter procedures or the fight against epizootic diseases (epidemics).
Manual of Good Practices in Bovine Production- SENASA	The Manual is designed as a tool to help producers reduce factors that affect the quality of their products. It presents minimum criteria to insure a good handling of the animals, optimise production and satisfy demand.

Table 4.2	
Guides, documents and reference manuals on animal welfare (continued)	
Document	Observations
Manual of Good Practices in Transportation SENASA	<p>Defines the characteristics of the vehicle to transport animals comfortably and safely. It mentions that the transfer operation from farm to slaughterhouse may be relevant to animal welfare and the quality of the meat.</p> <p>During transportation, the following are significant: the duration of transportation, load density, quality of the meat, characteristics of the vehicle, the driver's transportation skills, characteristics of the roads (curves, slopes); the climate and ambient temperature (heat, cold, rain, snow), characteristics of the animals transported in particular (age, sex, presence or absence of horns, nutritional state and health). It is possible to establish a relationship between <i>dark cutting beef</i> (dark cuts) and a prolonged stage before transportation and later slaughter. This Manual applies to domestic solipeds and other domestic animals of the bovine, buffalo, ovine, bovine, caprine, swine, equine and deer species in captivity, poultry, domestic birds and domestic rabbits.</p>

Institutions that promote animal welfare in Argentina

Argentinean institutions directly related to the implementation and verification of animal welfare practices are:

- *Secretariat of Agriculture, Livestock, Fisheries and Food (SAGPyA)*
responsible for developing and executing plans, programs and policies for production, commercialisation, technology, quality and health in agriculture, fisheries, forestry and Agribusiness endeavors, coordinating and combining the interests of the National Government, the Provinces and the different sub sectors. SAGPyA is under the Ministry of Production of Argentina. Under this Secretariat are the National Food Safety and Quality Service (SENASA) and, the National Institute of Agricultural Technology (INTA).
- *National Food Safety and Quality Service (SENASA)*
the State organisation in charge of executing national policies related to animal and vegetal health and quality and verifying compliance with the corresponding laws in force. It is in charge of the Animal Welfare Program, within the Dirección de Luchas Sanitarias (Bureau of Animal Health Control) in the Animal Health Area. SENASA Resolutions 253/2002 and 259/2004 cre-

ated the Comisión Nacional Asesora de Bienestar Animal (National Consultancy Committee for Animal Welfare) and the Coordinación de Bienestar Animal (Animal Welfare Coordination) to promote and implement animal welfare practices in all livestock production. The Manual of Good Practices in Bovine Production and the Manual of Good Practices in Transportation have been created within this Program.

- *National Institute of Agricultural Technology (INTA)*
in charge of promoting and invigorating the development of agricultural research and extension and accelerate the benefits of the fundamental functions of technification and improvement of the agricultural business and of rural life. INTA's main object is to contribute to the competitiveness of the agricultural, forestry and Agribusiness sector throughout the national territory, within a framework of ecological and social sustainability. With respect to animal welfare, INTA organises workshops for the promotion and implementation of good cattle-raising practices and conducts research on the economic and productive impact in specific cases and in certain provinces in Argentina.
- *Fundación Argentina de Bienestar Animal (Argentine Foundation for Animal Welfare, FABA)*
a non-profit organisation dedicated to health care, educational and legislative activities to elevate the quality of life of animals, and therefore of people. FABA promotes observance of specifications that guarantee animal welfare, considering the quality of feed, the environment, the facilities, the handling and compassionate treatment of animals, as deemed adequate for each species and productive characteristics. The Foundation is a member of the Global Task Force, Eurogroup, Brussels 2004/2005 and a Member of the Coordinating Committee on Animal Welfare, SENASA, from its creation to the present. It has developed various projects related to animal welfare.

4.3 Animal welfare in Argentina

In Argentina most of the information found on animal welfare refers to bovines. Studies have shown that losses sustained because of ill-treatment, stress, poor handling, and bruising of the meat, among others, result in significant economic losses for the Argentinean cattle industry (Figuroa, 2008). However, these losses were only quantified at the slaughterhouse and no studies exist that reveal losses incurred from primary production to slaughter. According to INTA (2008), advantages of animal welfare as perceived in Argentina are centered on

aspects such as food safety and quality. In general, animal welfare criteria are scarcely applied by producers, transporters and processing plants (Figuroa, 2008).

The following provides detailed insight into the animal welfare regulation, guidelines, practices and institutions for broilers, layers and pigs.

Broilers

For broilers no specific animal welfare legislation exists in Argentina. However, there are some particular mentions in public documents and manuals that present a frame of action: the Procedure Manual on Animal Welfare (SENASA, 2004), Law No. 14.346 dated 1954, and SENASA Resolution 614/1997. This last document focuses on health issues for qualification requirements for poultry farms, specifies that all farms should have a veterinary in charge who is responsible for farm health management. It also states that farms must have registry of all vaccinations, diagnosis of sicknesses, health treatments as well as performance and management indicators such as: weight gain, feed consumption, etc. In the case of broiler production, this resolution indicates that farms must have equipment for washing and disinfect of vehicles and equipment, special clothes and plastic footwear available for people entering the facilities, and an incinerator, compost pile or pit or any chemical, thermal, non-polluting system for in-farm disposal of dead birds.

A Manual of Good Practices for the Production of Broilers exists that offers recommendations for the site, ABS and equipment, among others, indirectly involving animal welfare practices (SAGPyA, 2000). The Manual includes standards for the land on which the sheds stand, lighting criteria, ventilation recommendations (enough to provide oxygen, eliminate carbon dioxide and ammonia gases and to control humidity and temperature). The Manual provides recommendations on washing and disinfecting, drink water supply, type of feeder, heating systems and bedding material.

According to Figuroa (2008), the Argentinean broiler industry has implemented Quality Management Systems that contemplate the fundamentals of animal welfare, guaranteeing the quality of its products.

At the broiler production stage, Figuroa (2008) presents certain recommendations in order to make progress towards handling the birds with respect for animal welfare. Factors that affect animal welfare of broiler during the primary production stage are:

- high animal density;
- nutritional over exertion;
- inadequate quality and handling of the litter;

- pollution;
- excess light;
- bad structure of the facilities, heating, etc.

To begin with, certain activities may cause short-term stress, such as precision debeaking, clipping roosters' fingers and decombing them, but they are necessary for long-term animal welfare since they may reduce injuries among the birds in the long run. These practices must be performed by well-trained personnel using the proper equipment. It is also recommended that the birds be raised in comfort and protection (Figuroa, 2008). In particular, it is mentioned that housing must be adequate to protect the birds from adverse environmental conditions, such as rainfall and the action of predators, and must include controlled levels of temperature and humidity. Attention is drawn on the housing density, birds must be allowed to move freely, and there must be enough space for all of them to settle at the same time without stepping on each other inside the cage. Regarding this topic, Figuroa (2008) recommends checking the number of square meters available according to the generic line of each breed. It is recommended that the facilities be checked periodically by someone responsible to verify that there are no irregularities (Figuroa, 2008). Indicators of poultry animal welfare at the production are:

- mortality;
- incidence, prevalence of multifactor diseases;
- percentage of animals with lesions caused by the environment or by other animals;
- decrease in growth or production;
- decrease of immune response;
- decrease of the reproductive function;
- hormonal changes associated to a response to stress;
- changes of heart rate associated to a response to stress;
- percentage of animals showing stereotypic symptoms and time dedicated to these;
- incidence of feather pecking or cannibalism.

Layers

For layers there is no manual of Good Practices. In addition to the information given on broilers, Figuroa (2008) recommends the following practices that can help improving animal welfare in laying hens:

- beaks cut off in order to reduce injuries resulting from excessive pecking. This operation must be done by well trained personnel using adequate equipment;
- hens must be bred in a comfortable environment. Housing should protect hens from climate adversities and predators;
- animal density in cages and stalls should be taken into account, in order to not having hens below or above each other inside the cage;
- area per hen should be planned and assigned according to the characteristics of the genetic line;
- infrastructure and equipment must be checked by an expert periodically.

Figueroa (2008) proposes the following indicators to evaluate animal welfare in laying hens:

- excessive feather pecking, cannibalism;
- mortality;
- sicknesses;
- lesions;
- decrease of growth or production;
- decrease of immune response;
- decrease of reproductive functions;
- hormonal changes associated to stress;
- cardiac frequency changes associated to stress.

Pig production

There is no legislation that regulates specific animal welfare practices for pig breeding and finishing in Argentina. According to Figueroa (2008), the welfare of pigs is frequently associated to the quality of the final product because stress in this type of animal causes damages to the production and affects the final quality of their meat. Figueroa (2008) reported that, in the case of the intensive production systems that have developed in recent years, a lack of proper handling of the pigs may lead to their living together in unnatural conditions. This report indicates that one of the main problems of intensive productions is overpopulation. However, in Argentina extensive production systems for both breeding and finishing prevail, so problems associated to malpractices are noticeably reduced. One of the drawbacks related to animal welfare in pigs is that the animal is subjected to stress due to overfeeding prior to slaughter. Figueroa (2008) found the following stress factors in pig production:

- early weaning of the piglets;
- bad structuring of the pens;

- incorrect feeding;
- inadequate lighting or ventilation;
- placing farrowing sows in cages;
- insufficient space available for each farrowing sow;
- stop mixing social groups;
- placing pigs in confinement on straw bedding or any other material that will allow them to preserve their instinct to root and explore with their snouts;
- the use of toys like balls or chains for pigs in confinement helps stimulate the animals positively.

5 Results of the survey on husbandry practice on broiler farms

5.1 Introduction

This chapter presents the findings of the survey conducted among businessmen and producers of the Argentine broiler sector order to identify relevant parameters related to Animal Welfare. In the present business design, 95% of broiler production takes place by means of contracts between farmers and integrator. The farmers producers raise broilers according to protocols established by the integrator. In spite of the structural heterogeneities that may exist among farms, this determines a high degree of standardisation of the broiler production.

For this survey the main producing companies were identified and contact was established with management in charge of production. Appointments were made and in the month of August 2009 there was a tour of the provinces of Entre Ríos and Córdoba to visit the main coordinating companies and their farms. Other businessmen preferred to answer the survey virtually. Eleven of the main broiler producers and processors in Argentina were interviewed, as well as their coordinated producers. Forty broiler producing units were surveyed that either form part of coordinated production or handle their own production. The companies interviewed concentrate about 60% of the national production.

5.2 General information

Seventy-five percent of the productive units (farms) surveyed are located in the province of Entre Ríos, where an important broiler cluster has developed in the country. The remaining 25% of the samples comes in equal proportions from the provinces of Córdoba and Buenos Aires. The number of sheds per farm may fluctuate between 2 and 6. However, the average number of sheds is between 2 and 3. The sheds have an average size of 1,350 m²; the most common size (45% of the cases) is 1,500 m². Sheds smaller than 500 m² were observed, as were sheds as large as 3,000 m². The average total number of birds per shed is over 15 thousand; this number is directly related to the animal density per square meter: most of those surveyed coincided that it was 10 birds per square meter. It was found that there is a wide range of age of the sheds, which goes

from 35 years to less than one year. The mean was 10 years of age, which coincides with the time of greatest transformations and investments in the broiler activity in Argentina.

Table 5.1 Summary of general information		
Characteristics	Average result	Observations
Number of sheds per farm	2,5	There are 2 to 3 or more on the farm, depending on the degree of technology and the size of the sheds.
Average density	10 birds/m ²	Slight variations were found according to the time of the year: the average increases in winter (11 birds/m ²).
Number of animals per shed	15,000 birds/shed	This varies according to the size of the shed. In general, those interviewed stated that they respected the average density.
Age	10 years	38-years-old sheds were found, as well as sheds of one year of age.

5.3 Infrastructure

Many of the sheds belonging to the companies and producers surveyed had natural ventilation (42.5%). At the same time, 25% of those surveyed declared that they combine natural and mechanical ventilation. 32.5% claimed to have only artificial ventilation systems, that is, only tunnels or tunnels with ventilation fans. The more technologically developed sheds have tunnel ventilation; this is the case of 17% of the productive units (in general, sheds of less than five years of age). Regarding the ventilation capacity measured in m³/animal/hour, those surveyed declared not to know this datum. Only three companies offered some indicators concerning this aspect. One of the companies stated that a typical shed with ventilation has 7 ventilation fans for approximately 16,000 birds. Each fan has a capacity of 40,000 m³ per hour. This generates 17.5 m³/bird/hour.

Regarding the feeding system, 65% of the productive units surveyed declared having automatic feeding. Twenty-seven percent combine the automatic system with the manual system with feeding hoppers, and only 7% claimed to have only manual feeding systems.

As for the drinking system, 87% said they used nipples, 10% said they combined the nipple system with bell drinkers, and only 2,5% mentioned that they only had bell drinkers.

The most common refrigeration system is the fogging type sprinkler (82.5%). 10.5% of those surveyed did not answer this question, and 7% declared that they did not have any refrigeration systems. Ninety-seven percent of the units sampled have gas bell heaters. Only one company stated that it has heating based on brooders.

Regarding the floors of the sheds, 70% have compacted soil floors; 7% of them combine cement with compacted soil, and 22% declared that they used other materials. Table 5.2 gives a summary of the indicators and the average infrastructure results according to those surveyed.

Infrastructure Indicator	Average Result	Observations
Ventilation	Natural: 42.5% Automatic: 32.5% Natural and automatic: 25%	The higher technology sheds only use tunnel type automatic ventilation.
Feeding system	Automatic: 65% Manual: 7.5% Automatic and manual: 27.5%	
Drinking system	Nipples: 87.5% Bell drinkers: 2.5% Nipples and another system: 10%	
Refrigeration	Fogging type sprinkling: 82.5% Did not answer or does not use: 17.5%	
Heating	Gas bells: 97.5% Brooders: 2.5%	The brooders system is owned by the most recent, vertically integrated company.
Floors	Compacted soil: 70% Other materials: 22.5% Soil and cement: 7.5%	

5.4 Management

The bedding used is predominantly rice chaff (82.5%). Also used is a combination of rice chaff with sunflower or peanut chaff (10% of all cases) and wood shavings, among other materials (7.5% of those surveyed). The choice of materials for the bedding is related to the regional supply: Entre Ríos is near rice-growing areas, while in Córdoba the sunflower and peanut production is more relevant.

As for the lighting management, all those surveyed stated that they use lighting programs combining natural and artificial light. The programs are designed according to the age of the chicks and the time of the year. In the first two weeks, the light period has duration of 20 to 23 hours (according to 17% of those surveyed). Later, the levels decrease until they reach an average of 17 hours of light and approximately 8 hours of darkness daily.

All of the productive units surveyed declared that they used manual methods to catch the birds. Some mentioned that they catch the animals in the dark in order to lower their levels of stress. In general, the teams are made up of 15 persons, who catch around 1,000 broilers per hour. This represents an average of 100 birds per person/hour. Later the broilers are introduced, two at a time, into cages with a capacity of 10 broilers.

As for the production break for cleaning, that is, the time the shed remains empty of animals between flocks, its length is an average of 14 days. However, all those surveyed admitted that the number of days may vary according to the dynamics of demand. There were cases mentioned of 2 days of production break, and, on the other end, cases of 20 days.

Regarding cleaning, 100% of those surveyed stated that they use methods that combine manure removal and renewal of the bedding. On the average, those surveyed perform these 2.4 times a year. Besides including manure removal, in 52.5% of the cases this cleaning procedure includes the use of disinfectants, and 22.5% the addition of lime. 25% only renew the bedding. Table 5.3 gives a summary of the indicators analysed and their average results.

Management indicator	Average result	Observations
Bedding	Rice chaff: 82%	Sunflower and peanut chaff and wood shavings are also used.
Light	Natural: 100% and artificial. 17 hours a day on the average	The average is higher in the first two weeks of life, up to more than 20 hours. Artificial light is also used in winter.
Darkness	Less than 8 hour average	It is drastically reduced in the first two weeks of life.
Catching	Manual 100% 100 birds/worker/hour	On the average, two broilers at a time per person are introduced in the cage.
Production break	14 days	According to the demand of the market, these days may be reduced.
Cleaning	Manure removal and bedding renewal 100% Twice a year	Some also disinfect and add lime.

5.5 Performance

The breed of broiler most widely used by the companies surveyed is AA, with a participation of 45%; it is followed by Cobb, with 35%; there were cases that raised all three most common breeds: Ross, Cobb and AA (12.5%) or a combination of Ross and Cobb (7.5% of all cases).

The duration of the average finishing period is 48 days. A minimum duration of 37 days and a maximum duration of 50 days were observed. The average final live weight of the broilers is 2.6 kg, with minimums of 1.6-1.7 kg and maximums of 2.9 to 3 kg. These variations correspond to the demand characteristics of the markets: the Argentine consumer prefers a heavier broiler (2.2-2.5 kg), yellow coloured, while some international markets demand broilers with an average weight of 1.5 kg. According to those interviewed, the average weight gain per day is 55 grams per bird. Regarding depopulation practices, 77% of the cases informed that they do not carry them out. 23% of those surveyed, who said they did, indicated that the practice consists in taking the ma-

les away from the sheds after 45 days, leaving the females in them for an extra 5 to 7 days.

The average feed to animal weight conversion rate is 2.02 kg feed/live kg. The conversion rate varies according to gender: the male is genetically more efficient (1.7 kg/kg) than the female (2 kg/kg).

The average mortality rate in the sample surveyed is 5.5% along the entire reproductive cycle. Mortality in the first week of life had an average of 1.08%. The most common mortality causes are respiratory problems; also mentioned were congenital problems, contamination of the yolks (defective chicks before they were born), colibacillosis, and digestive problems, among others. Table 5.4 summarises the main indicators.

Performance indicator	Average result	Observations
Breed	AA: 45% Cobb: 35% Ross + Cobb + AA: 12.5% Ross + Cobb: 7.5%	
Fattening time	48 days	This varies according to market demand and needs.
Final live weight	2.6 kg	This varies according to market demand and needs.
Daily weight gain	55 grams	
Depopulation practices	Not practiced: 77%	Practiced on some occasions, especially with males.
Feed conversion rate	2.02 kg	Varies according to gender.
Mortality rate	5.5%	In the first week, the average rate was 1.08%.

5.6 Density

The average density used on the broiler farms 10.6 birds/m². This density varies according to the climate: in summer, densities may vary from 9 to 10 birds/m², and in winter it may increase to 11 to 12 birds/m². In higher technology sheds, an average density of 11 birds/m² was found; this is particularly related to the existence of ventilation systems. The number of day old chicks per shed is constant from the first day of finishing. The handling practice used con-

sists in regulating the use of the shed surface area, varying the density: during the first days, 16% to 25% of the area of the shed is used so that the density of the baby chicks is around 40 to 60 birds/m². As the cycle progresses, there is an increase in the area of the shed used, until it reaches average densities of 10 birds/m². In average the density on the last day would be 10.64 * 2.66 kg live weight * (100-5,58) is 26.7 kg per square meter of poultry house.

Company	Density (birds/m²)	Final live weight (kg)	Mortality (%)
1	12	2.6	5.50
2	10.5	2.75	7
3	10	2.3	5
4	10	2.7	6
5	11	2.6	5
6	10.5	2.6	7
7	10	2.75	5.50
8	13	2.7	6
9	10	3	5
10	10	2.7	5
11	10	2.6	4.85
	10.64	2.66	5.58

5.7 Transport

The birds are transported in crates loaded on trucks up to the slaughterhouse. The typical crate is approximately 0.80 m x 0.50 m x 0.35 m. The average transportation density is 8 birds per crate. The average transportation time is one hour. Some extreme cases were observed in which transportation had a duration of up to 4 hours, while in other cases it was less than half an hour. Average mortality during transportation is 0.05%. Table 5.6 summarises the main indicators.

Table 5.6 **Summary of transportation indicators**

Transportation indicator	Average result	Observations
Transportation means	Crates on trucks	
Density	8 birds per crate	Average dimensions: 80cm by 50cm. Other boxes: 1 m by 1.4 m.
Time	1 hour	
Mortality	0.05%	

Also slaughter quality criteria were discussed. The first aspect that came up in the interviews was that of good body build. This is related to the handling of the birds at the moment of catching and transportation, which must be carried out in such a way as to avoid broken wings and bruising on the breasts and thighs among other signs of ill-treatment that end up harming the quality of the meat. In relation to this, one practice used to avoid the birds' panic and stress at the time of catching, transportation and arrival at the slaughterhouse is to perform these procedures in the dark.

Some of those surveyed mentioned that they applied fasting practices before slaughter, some with special feed one week before, others with an 8-hour fasting period. They also mentioned keeping the animals well-hydrated until the last minute.

6 Results of the survey on husbandry practice on layer farms

6.1 Introduction

The current business design for layer production is predominantly that of independent companies. Each company has its own protocols (if any) for rearing pullets and keeping layers. This means that production is not homogeneous with some important variations between companies. A first differentiation appeared between large operations (over 300,000 layers), medium-sized operations (between 100,000 and 300,000 layers) and small operations (under 100,000 layers). For the survey for each group 10 companies were selected. Visits were scheduled during August and September 2009. In total 30 companies were included in the survey: 10 large operations, 10 medium-sized operations and 10 small operations. Out of the 30 companies, 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. It is important to state that the companies interviewed as large operations are in fact the biggest producers in the country.

6.2 General information

The average number of poultry houses is 7.4, although it fluctuates from 23 to 1. The average size of the house is 4,750 square meters, with the largest ones having 7,000 and the smallest one 1,500. Concordantly, the average size of the flock is 377,470 layers, but the amount ranges from 7,500 to 1,400,000 layers. The average amount of birds per house was just over 42,000 birds, although the figure ranged from 100,000 to 7,500. There is a huge spread in terms of average age of the houses. In the operation with the newest houses, they were 2 years old in average, and the oldest average age for houses was 32, with an overall average age of 11.4 years. Table 6.1 gives an overview.

Characteristic	Average	Observations
Number of houses per operation	7.4 stalls	The figure ranges from 23 to 1.
Average number of layers per operation	377,470 layers	
Average number of layers per poultry house	42,000 layers	
Average age of poultry house	11.4 years	Some houses were 32 years old, while others were 2 years old.

6.3 Infrastructure

In terms of infrastructure, all of the assessed operations used the battery cage system. In terms of number of rows, the average number is 4.2 with a spread ranging from 6 to 2, while the average number of levels/tiers is 3 with extremes at 5 and 2. As regards ventilation, 7 (23.3%) operations had natural ventilation and 23 (76.7%) had mechanical ventilation. As for the type of mechanical ventilation, 17 operations used tunnel ventilation, while 4 used roof ventilation and 2 used side (lateral) ventilation. 5 out of the 23 operations with mechanical ventilation could also use natural ventilation, the rest have it as an exclusive system. In terms of feeding system, just 4 (13.3%) operations used manual feeding, the remaining 26 (86.7%) used some sort of automation. Of the 26 that have an automatic system, 2 (6.67%) had a mixed automatic/manual system. As for the water system, the vast majority (90%) of the operations used an automatic system and all of them used the nipple system. The remaining 10% used some sort of combined method, between manual and automatic water supply. Regarding cooling, 27 out of the 30 surveyed operations had a cooling system with pad cooling (14 farms) and fogging (12 farms) being the most common and just one case of completely controlled atmosphere with an automated temperature and humidity system. 3 of the surveyed farms did not use a cooling system, with one of the operations being located in Río Negro a Patagonian province, where heat is not a big issue. Heating systems are not common in layer operations and the survey shows exactly that, with 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,

while the remaining 4 used a manual system. Table 6.2 shows the results of the infrastructure assessment.

Table 6.2 Summary of infrastructure indicators		
Infrastructure indicator	Result	Observations
Ventilation	Natural: 23.3% Automatic: 60% Natural y automatic: 16.7%	High Tech stalls use auto- matic ventilation only.
Feeding system	Automatic: 80% Manual: 13.3% Automatic y manual: 6.7%	
Water system	Nipples: 90% Mixed manual and automatic: 10%	Within the mixed system, 1 operation used the nipple wa- ter system along with manual.
Cooling	No cooling: 10% Fogging: 40% Pad cooling: 46.7% Controlled atmosphere: 3.3%	
Heating	Yes: 13.3% No: 86.7%	
Egg collection system	Automatic: 86.7% Manual: 13.3%	

Pullet rearing system

In terms of rearing, 4 variables were assessed: location, rearing system, beak trimming performed and transfer from the pullet to the layer house. It is important to establish that not all of the operations had their own rearing system, but some of them purchased young pullets. However, all of the surveyed operations could confidently answer the questions on rearing. Regarding 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. With regards to the trimming of the beak, all of the surveyed farms used pullets that had their beaks trimmed, and the average age at which it was performed was 11.6 days with a range of 6 to 28 days. The beak trimming also differed in how much of the beak was trimmed, with 13 (43.3%) operations trimming 1/4 of the beak, 12 (40%) operations trimming 1/3 and just 5 operations trimming 1/5 (16.7%) of the beak. 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. Table 6.3 shows the results of the rearing assessment.

Table 6.3 Summary of rearing indicators		
Rearing indicator	Result	Observations
Location	Same location: 10% Different location: 90%	Some companies do not own a rearing system.
Rearing system	Cages: 83.3% Litter floor: 16.7%	
Water system	Nipples: 90% Mixed manual and automatic: 10%	Within the mixed system, one operation used the nipple water system along with manual.
Beak trimming (average age)	11.6 days	
Beak trimming (sort)	1/4: 43.3% 1/3: 40% 1/5: 16.7%	
Transfer from the pullet to the layer house (average age)	18.2 weeks	

6.4 Management

In terms of management, three variables were to be assessed: type of light, light schedule and empty period between flocks. In types of light, 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, with a range of dark hours between 7 and 9 hours. 5 operations did not answer the question. It is important to state that during the summer, very few hours of artificial light are used; a typical practice is that of using an hour of artificial light at night during summer so that the hens may eat when it is less hot. The empty period between flocks averages about 22 days, with a range in the assessed figures of 16 to 30 days. Table 6.4 shows the results of the layer management assessment.

Rearing indicator	Result	Observations
Type of light	Little daylight : 43.3% Bright daylight : 30% Dark house: 26.7%	
Dark hours (average)	7.8 hours per day	During the summer, very few hours of artificial light are used.
Empty period between flocks (average)	22 days	Wide range: from 16 to 30 days.

6.5 Performance

In table 6.5 the main indicators for performance are given. In the second column this is for all farms and in the third column the average is given for the bigger layers farms (more than 200,000 layers). In terms of performance, the first variable to be assessed was the length of the laying period, which showed an average figure of about 532 days, with a range of laying periods going from 440 to 650 days, this period often includes a popular practice of molting. The average amount of eggs laid is 352.5, with a 320-425 range of laid eggs. For the larger farms the average is 584 days and a production of 374 eggs. Out of this production it is estimated that an average 11.5% or 9,1% 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, for the larger farms 130 grams per hen per day. On the most modern farms feed intake was just over 100 grams per day. It is important to state that a major factor in feed intake amount is the breed of the hen: brown hens tend to eat much more than white hens. In terms of feed conversion, the average observed was just below 2.8 kg of feed for each kg of eggs produced. On the larger farms the average was 2,3 and on the more efficient this figure was just over 2 kg of feed per kg of eggs.

In terms of mortality rate, the average percentage observed in the surveyed farms was 9 and on the larger farms 7.7. This figure is highly dependent not only on the breed used, but also on the technology level of the operation. The hi-tech operations have managed to lower this figure to about 6% total mortality. The main causes of layer mortality in the surveyed operations were temperature related problems (more often related to heat than to cold), prolapse and age,

but it was impossible to find out percentages for them. The mortality figures ranged from 6 to 16% with the following distribution over the companies:

- 3 companies with 6% or less mortality;
- 2 companies with 7%;
- 6 companies with 8%;
- 10 companies with 9%;
- 5 companies with 10%;
- 4 companies with over 10%.

Table 6.5 Summary of layer performance indicators		
Indicator	Result all farms	Larger farms
Length of laying period	532 days	584
Number of eggs (total)	352.5	374
Second grade eggs (total laying period)	11.5%	9.1%
Feed intake (gram per hen per day)	160	130
Feed conversion (kg feed/kg eggs)	2.8	2.3
Mortality total	9%	7.7%
Most common causes of death	Prolapse, temperature, age.	Prolapse, temperature, age.

6.6 Density

In terms of cage size, the average depth was 48.5cm, while the average height was 44.5cm and the average width, 60.3cm. In relation to this, the average amount of hens per cage added up to 7.87 hens per cage with a range of 5-9 hens per cage depending on the operation. The average space allowance per hen was 372cm² per layer. However, there are differences between the companies. The range in space allowance was 278 to 500cm² with the following distribution over the companies:

- 8 companies with 278cm²/hen;
- 14 companies with 312cm²/hen;
- 5 companies with 357cm²/hen;
- 2 companies with 417cm²/hen;
- 1 company with 500cm²/hen.

6.7 Transport

Layer transport from the layer house to slaughter is done by truck in crates or boxes that carry in average 8 or 9 birds. These boxes are approximately 80cm long by 50cm wide by 35cm tall, which at 8 birds per box gives an average volume of 17,500cm³ per bird. The average transport period is just below 2 hours, in which the birds are transported to the slaughter house and transferred. The range was wide with some operations transporting layers within the hour and others having a 4-hour long journey. Mortality during transport could not be adequately mentioned by farmers but it is estimated at around 0.2%. It was also very difficult for the farmers to establish how much time it took in average for the trucks to wait in the lairage before the hens were processed, but the estimation is that it takes about 15 minutes. Table 6.6 shows the results of the transport assessment.

Rearing indicator	Result	Observations
Means of transportation	Cages or boxes by truck	
Density	8-9 birds per cage	
Time	2 hours	
Mortality	0.2%	

7 Results of the survey on husbandry practice on pig farms

7.1 Introduction

This chapter presents the results of a survey conducted amongst businessmen and producers in the Argentinean pig sector in order to identify relevant parameters for Animal Welfare. Institutional contacts were made to set up direct interviews. Several producers from different provinces, with different farm size, were identified and interviewed.

7.2 General information

Of the farms surveyed, 35% were located in the province of Córdoba, 33% in the province of Neuquén, 16% in the province of Santa Fe, 12% in the province of Buenos Aires, and 4% in the provinces of Salta and Tucumán. Table 7.1 provides the distribution over farm size.

Size	Percentage
Up to 10 sows	33
Between 11 and 50 sows	33
Between 51 and 100 sows	16
Between 100 and 500 sows	12
Over 500 sows	7
Total	100

Of the surveyed farms, 65% had mixed production systems, combining confinement and open air production, 28% had only confinement, and 7% had only open air production (table 7.2). About half the farms were closed farms with a complete cycle, half only had breeding and rebreeding¹, and 1 rebreeding and fattening.

¹ Rebreeding is fattening piglets after weaning until around 25 kg, when they are sold to a finishing pig farm.

Table 7.2 **Surveyed farms by production system and production stages**

Activity	System	Number of farms	Percentage
Complete cycle	Pasture	2	5
	Mixed	8	19
	Confinement	11	26
Breeding and rebreeding a)	Pasture	1	2
	Mixed	20	47
	Confinement	0	0
Rebreeding ^a and finishing	Pasture	0	0
	Mixed	0	0
	Confinement	1	2

a) Rebreeding is fattening piglets after weaning until around 25 kg, when they are sold to a finishing pig farm.

7.3 Breeding stages

In this report the results are discussed of the breeding farms with more than 50 sows and farms with confinement systems in all production stages. Based on this selection criteria 43 farms were surveyed, 12 of them have confinement systems in all production stages. Of these, 9 have more than 51 sows. Based on data surveyed from these farms, average results and standard deviations were calculated and presented in the following tables.

Infrastructure

Table 7.3 presents infrastructure indicators for the sample of pig farms in Argentina. Of the sheds, 69% had mechanical ventilation, generally consisting of extractors and fans. The rest had natural ventilation based on a system of manual curtains. Of the sheds for breeding and rebreeding, 78% had manual feeding systems. The remaining 22% used automatic feeding systems. Of the sheds, 59% had no cooling systems, the remainder had evaporative panel cooling systems or used water sprinklers. The farms that had cooling systems were generally of larger production size (over 200 sows). Of the gestation and farrowing/nursing sheds, 75% had heating systems, such as thermal blankets, gas heating, radiated heat, and salamander stoves. Of the sheds, 73% had cement floors combined with metal or plastic plates, the other farms had cement floor only or dirt floors. For pregnant sows, 72% of the farms for both pasture and confinement had individual housing. The average area for these sows was

2.1m² per sow. On farms that use confinement production, the average size of the group of growing piglets is 67 animals with an area size of 0.3m² per piglet.

Characteristic		Average	Standard deviation
Type of ventilation	Natural	31%	-
	Extractors and/or fans	69%	-
Feeding system	Manual	22%	-
	Automatic	78%	-
Drinking system	Manual	4%	-
	Automatic	96%	-
Cooling system	None	59%	-
	Evaporative panels	33%	-
	Sprinklers	8%	-
Heating system	None	25%	-
	Yes	75%	-
Type of floors	Cement combined with metal or plastic plates	73%	-
	Cement	27%	-
Farms with open-air areas for confined animals	Gestation	11%	-
	Farrowing/nursing	0%	-
Average area/farrowing sow (m ²)	Confinement	3.8	0.5
Type of housing for pregnant sows	Individual	72%	-
	Group housing	28%	-
Average area/pregnant sow (m ²)	Confinement	2.1	1.1
Average area per piglet (m ²)	Confinement	0.3	0.05
Size of the group of piglets	Confinement	67	65

Performance

Bearing in mind the variability of the performance indicators according to the different types of productive systems, the data obtained were classified based on the type of production of confinement on bigger farms. Table 7.4 presents the basic performance indicators for breeding and rebreeding farms in Argentina.

Characteristic		Average result	Standard deviation
Farrowing rate (litters/sow/year)		2.3	0.2
Number of live births (piglets/litter)		12	1
Number of still births (piglets/litter)		0.7	0.4
Weaning age (days)		22	3
Mortality rate till weaning (%)		10	8
Bedding material	Gestation	No bedding used	100%
	Farrowing	No bedding used	89%
		Straw bedding	11%
	Weaning	No bedding used	100%

Transportation

Transportation systems for piglets from breeding and rebreeding stage to the finishing stage differed according to the type of production system. On farms with a complete production cycle internal transportation of the animals was mostly done by cart. Farms devoted only to the breeding and rebreeding stage transported their piglets by means of trucks. Specialised piglet transportation trucks were scarce. Trucks for piglets generally were adapted bovine cattle trucks. The average density during transportation in trucks was 0.8 m² per piglet and no water was available. The average transportation duration was 12 minutes, and no mortality cases were observed during transit.

7.4 Finishing stages

General Information

Table 7.5 provides general information about the finishing pig farms in the survey.

Characteristic	Average result	Standard deviation
Number of finishing sheds per farm	6	6
Number of finishing pens	37	27
Number of finishing pigs per pen	25	11
Age of the sheds (years)	6.3	6

Infrastructure

Table 7.6 provides infrastructure indicators for the finishing pig farms in the survey. Feeding and drinking systems in the finishing sheds were automatic on all larger farms. Natural ventilation was present in 55% of the finishing sheds, and mechanical ventilation in the remainder. Cooling was done with sprinklers at 45% of farms, the rest had no cooling system. There were no heating systems installed for this productive stage in any of the farms surveyed. In all the farms devoted to confinement finishing, the floors of the sheds were of cement, of which 70% stated they had full slat cement floors. Of the farms, 89% declared that they did not have open air areas.

Table 7.6		Finishing pigs, infrastructure indicators
Characteristic		Average result
Shed ventilation	Natural	55%
	Mechanical (fans)	45%
Feeding system	Automatic	100%
Drinking system	Automatic (nipples)	100%
Cooling system	None	55%
	Sprinklers	45%
Heating system	None	100%
Type of floors in sheds	Cement	70%
	Cement - full slats	30%
Open air areas	None	89%
	Yes	11%

Handling

Table 7.7 provides handling indicators for the surveyed finishing pig farms. The area for finishing pigs bred in confinement was 1.0 m². No farms used bedding. The period of artificial light was 14 hours of light and 10 hours of darkness. One farmer stated that he kept 24 hours of light, using dim lighting during the night to keep bats away.

Table 7.7 Finishing pigs, management indicators

Characteristic	Average result	Standard deviation
Area for the finishing pigs (m ² /pig)	1	0.5
No bedding material	100%	-
Farms that have artificial lighting	44%	-
Hours of light*	15	2.5
Hours of darkness	9	2.5

Performance

Table 7.7 provides performance indicators for the surveyed finishing pig farms. In order to analyse the performance indicators, they were classified for the productive system in confinement. For finishing farms with confinement the duration of the finishing stage was 89 days with a weight gain of 76.6 kg. The feed conversion rate was 2.8 kg of feed per kg of live weight. Mortality during finishing was 2%.

Table 7.8 Finishing pigs, performance indicators

Characteristic	Average result	Standard deviation
Duration of the finishing stage (days)	89	13
Final live weight (kg)	110.3	4.4
Initial weight in the finishing period (kg)	33.7	10.4
Age when entering finishing	76	12
Daily growth during (kg/day)	0.7	0.4
Feed conversion rate (kg/kg)	2.8	0.5
Mortality rate (%)	2	1

Transportation

Finishing pigs were transferred from finishing farm to the slaughter plant with different types of transportation. In 100% of cases, the transportation contracted was not specialised for finishing pigs. Of the farms, 64% stated the pigs were transferred in cage trucks, generally the same that are used to transport bovines, 32% indicated transport in more specialised trucks with double flooring, and 4% stated usage of pickup trucks with trailers. Density during transportation to the slaughter plant was 0.5 m² per pig. Transportation to slaughter took on average 2.4 hours. The average mortality rate during transport was 0.4%. Of the farms, 9% stated that the pigs had access to water during transportation to slaughter, usually associated with longer transportation times to the

slaughter plant under high temperatures. In no case feed was provided during transportation.

Other Information

All farms stated that the surface area per pig is kept constant during the finishing period. Of the farms, 41% kept the pigs in the same pen from start to slaughter. Half of the farms declared that the finished pigs of one litter are delivered to the processing plant in one lot, the other half of the farms deliver them in different lots. Of the farms, 41% use toys for the animals as chains, balls, tires or pools.

8 Conclusions and discussion

Based on the surveys and the workshop held in Argentina this chapter gives the main conclusions for the broiler, layer and pig sectors. After the conclusions for broilers, layers and pigs, some general conclusions and remarks for discussion are presented.

8.1 Broiler sector

Argentina is an important producer of broiler meat, positioned worldwide as the 9th producer with a production of 1,425,000 tonnes in 2009. In particular since 2002, after the crisis, production more than quadrupled. Currently exports exceed imports, representing 16% of the total produced value.

Argentina is a low-cost country. Production costs are 30 to 40% lower than the EU level. Also compared to other important poultry meat producers, like the USA, Brazil and Thailand, the production cost in Argentina are slightly lower. This means that Argentina is competitive on the world market and there is potential for further growth.

In Argentina there are 3,926 farms that produce broilers. The province of Entre Ríos concentrates 56.5% of those, followed by the province of Buenos Aires, with 41.5%. Slaughterhouses are also concentrated in these two provinces. A group of six integrators account for over 50% of the total slaughter of broilers. Broiler farmers and integrators are organised in two chambers (CAPIA and CEPA, respectively), and have implemented joint strategies. This strategic plan does focus on promoting exports and improving the health status in the broiler sector.

In the broiler sector, integrators provide broiler farmers with feed and day old chicks, as well as technical support. Incorporation of technology in the farms thus has mainly been promoted by the integrators. The modality for this incorporation has been based on the purchase of technology (genetics, equipment) by the integrator and the development of finance plans for the farmers. This explains the high standardisation of broiler production systems in Argentina.

Although Argentina does not have specific legislation to determine the general framework and procedures for animal welfare, it does have partial legisla-

tive developments and some public and private reference documents for the primary sector.

No specific guidelines or manuals on animal welfare for the production of broilers exist, but there is a Manual of Good Practices for the Production of Broilers that indirectly poses animal welfare criteria. According to the evidence collected through the survey conducted and the interviews with producers and businessmen of the sector, in Argentina producers do not consciously implement animal welfare practices on broiler. In fact, the topic is alien to the daily production activity. However, the quality and health protocols of the integrators indirectly include some parameters that contribute to animal welfare.

In the EU legislation on broiler welfare is concentrated on three aspects: density, mortality and housing conditions (especially ventilation).

- The average density in the surveyed poultry houses of 26 kg/m² (10 birds/m²) is well within the standards demanded by European legislation of 33 to 39 kg per m². However, regarding density, no Argentine Manual or institutional document expressed a tolerable range for animal welfare.
- The mortality rate on day 1 in the survey was on average 5,5%, and in the first week 1.08% The most common mortality cause are respiratory problems. After corrections for the longer growing period the mortality percentage is only slightly higher compared to the average situation in some EU countries.
- In reference to ventilation no reference parameters were found either in the legislation or in the Manuals of Argentine institutions, nor in the protocols of the integrators. Although there are ventilation systems, mainly based on manual curtain and fans, those surveyed did not mention any methodical control of the ammonia or carbon dioxide levels.
- In general, the productive units surveyed comply with the national criteria and recommendations regarding bedding, type of drinkers, lighting criteria, feeders, and heating, among others.

It was inferred that the broiler transportation stage is not traumatic: average duration is less than an hour, and mortality rates are low during transport. At the same time transportation of the broilers is done in crates. The opening of the crates is relatively small which can cause injuring putting the birds in the crates. In general, it was found that the companies try to minimise harm done to the broilers, such as broken wings or bruising, among others, that might be detrimental to the appearance and quality of the meat.

8.2 Layer sector

Argentina is the 19th world producer for eggs in terms of volume. Egg production in Argentina has been growing steadily since the 1990s both in production, value and exports. The production is expected to keep on growing over the next few years.

An increase in the levels of technology can be observed, with larger and more technological operations being launched and the modernisation 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. In general the egg sector is oriented towards the domestic market. 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.

Egg processing has also been growing, currently consuming over 11% of total production. 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.

Egg production is almost entirely organised by independent farmers and companies. No such integrator contracts as used in broiler production are common.

No legislation exists that regulates specific animal welfare practices for layers in Argentina. However, there are some public documents and manuals that present a frame of action. Among these are the Procedure Manual on Animal Welfare and a law of 1954 (which e.g. penalises insufficient quantity and quality of feed supply).

A survey was conducted and interviews with producers and businessmen in the egg sector were held. The survey 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 poultry houses was 7.4 with an average size of the flock at 377,470 layers per operation and 42,000 per poultry house.

Not all of the operations had their own pullet rearing system. 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 happened at the average age of 18.2 weeks, with the most efficient farms transferring them at 16 weeks.

On farms with layers the poultry houses had the following standards:

- Ventilation is generally mechanic (over 75% of farms), while feeding used some sort of automation in 86.7% of the farms and water supply was auto-

matic in 90% of the farms. Regarding cooling, 27 out of the 30 surveyed farms had a cooling system, while just 4 out of the 30 farms 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 farms used an automatic system.

- In terms of management, the survey showed that 13 farms used little daylight, 9 farms used bright daylight and 8 farms 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 averaged about 22 days.

Factors directly related to the welfare of the hens were space allowance, methods of beak trimming and mortality rate:

- All farms in the survey kept layers in cages. The type of cages differed between the farms. The average space allowance was 372cm² per hen. However, there was a wide range from 278cm² (8 companies) to 500cm² per hen (1 company).
- All surveyed farms used pullets that had their beaks trimmed. The average age at which this was performed was 12 days with a range of 6 to 28 days. The beak trimming also differed in how much of the beaks was trimmed with the majority of farms trimming ¼ or 1/3 of the beak.
- The mortality rate, as a percentage of the numbers at the start at the surveyed farms was just over 9%. On the larger farms the average mortality rate was 7.7% The average mortality rates ranged from 6 to 16% per company.

Layer transport from the layer house to slaughter was done by truck in crates or boxes that carry in average 8 or 9 birds. The average transport period from farm to slaughter house was just below 2 hours.

8.3 Pig sector

The total Argentinean pig herd has over 3m animals. Pig production in Argentina concentrates in the provinces of Córdoba, Buenos Aires and Santa Fe. The negative impact of the Argentinean crisis during the beginning of this century on production and consumption of pork has been turned around. The production and consumption figures are at its height now (2008).

In spite of the comparative advantages of Argentina regarding resources for pig production, the country is currently an importer, mainly fresh meat from Brazil. The domestic production is for 85% destined in the cold meats sector. Cold meat, like sausages, is a major component within the Argentinean diet.

Argentina has just over 56,000 farms producing pigs. Pigs in Argentina are kept in extensive open air systems, intensive confinement systems, and in combinations of these two systems. About 80% of pig farms in Argentina are small with a maximum of 10 sows, and only 0.1% have over 500 sows. For example, the farmers who have more than 100 sows, 2,4% of the total of producers registered, actually own 34% of the national number of sows.

In general, the predominance of swine pasture production systems in Argentina would suggest better animal welfare conditions. However, these systems is that, in spite of having low capital investment as compared to intensive systems, are productively more inefficient. This can be explained not only by climatic impact (extreme heat, cold, rains) but also by the technological inefficiency of the farms regarding the incorporation of process and product technology and the expert skills of the farmers. On the other hand, these systems, predominantly subsistence or low scale, are frequently associated to informality. This means that health and fiscal controls are lax or inexistent, and this fact constitutes a restriction to the adaptation of the agribusiness system to customer needs.

The survey based on breeding farms with more than 50 sows and with confinement systems in all production stages showed that, in general, pigs had enough space. Only 28% of farms used group housing for pregnant sows. Lack of climate control in most housing systems could lead to welfare problems, although this highly depends on the exact location of the farm. Almost no farms use bedding at the finishing stage. Distraction material is lacking on many farms.

According to the data obtained through the surveys conducted and the interviews with producers and businessmen in the sector, in Argentina, producers do not consciously implement animal welfare practices in swine production; in fact, the topic is alien to daily production.

Transportation of the pigs to slaughter is carried out by means of trucks contracted for this purpose. These trucks are not specialised for in transporting pigs, but are generally adapted bovine trucks. Even so, according to the information obtained from the surveys, no anomalies or practices against welfare were observed. In fact, the mortality rate is low and the duration of the trips is short.

8.4 General conclusions

Argentina is a country with low primary production costs. This is the situation for all three sectors: broilers, layers and pigs. 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 actual situation at farm level it can be concluded that there is large difference between the sectors. The husbandry conditions directly related to animal welfare are relatively good for broilers and fattening pigs. For layers and sows the conditions are below the average situation in EU countries in North-West Europe. For the layers in particular the average space allowance per hen is below the EU level and far below the new level implemented in 2012.

In all 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 and sow sectors an overall change in husbandry systems is necessary in Argentina. New housing systems (enriched cages or floor housing) have to be introduced for layers and group housing for sows. 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 Argentina poultry and pig sector should actively approach the market (partners) and look for the dialogue and possibilities to sell high value animal welfare products.

Whether the Argentinean sector 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.

References and websites

Estol, L., *Animal en Latin America*. Documento interno de la Asociación Latin American de Bienestar Animal, 2007.

European Commission, *Commission working document on a Community Action Plan on the Protection and Welfare of Animals 2006-2010: strategic basis for the proposed actions*. European Commission, DG Consumer Protection and Health, European Union, Brussels, 2006.

Figueroa, M. E., *El estado del Arte del Bienestar Animal en la Argentina*. Documento Interno. Instituto Nacional de Tecnología Agropecuaria (INTA), 2008. www.inta.gov.ar

Grosz, S., *Esquema de la Cadena Productiva del Porcino*. Consejo Federal de Inversiones, Abril de 2007.

Horne, P.L.M. van and T.J. Achterbosch, 'Animal welfare in poultry production systems: impact of EU standards on world trade'. In: *World's Poultry Science Journal* 40 (2008), pp 40-51

Ingenbleek, P., M. Binnekamp en S. Goddijn, 'Setting standards for CSR: A comparative case study on criteria formulating organisations'. In: *Journal of Business Research* 60 (2007), pp. 539-548.

OIE, 2009. Organización Mundial de Sanidad Animal: www.oie.int

Palau, H., S.I. Senesi, R. Pizzorno, C. Otaño en F. Vilella, *Governance Structures in the Argentine Broiler Industry*. IAMA (International Food and Agribusiness Management Association) www.ifama.org. XVII Annual Conference 2007, World Forum and Symposium, Parma, Italy, 2007.

PVE, *Kengetallen Vee, Vlees en Eieren 2008*. PVE, Zoetermeer, 2009.

Rojas, H., L.Y. Stuardo and D. Benavides, *Reglamento (CE) Nº 1/2005, del Consejo de 22 de diciembre de 2004. Políticas y prácticas de bienestar animal*

en los países de América: estudio preliminar. In: Rev. sci. tech. Off. int. Epiz. 24 (2005) 2, pp. 549-565.

SAGPyA (Secretaría de Agricultura, Ganadería, Pesca y Alimentos), *Guía de aplicación de Buenas Prácticas de Manufactura: faena y procesamiento de pollos parrilleros.* 2000. www.alimentosargentinos.gov.ar

SAGPyA (Secretaría de Agricultura Pesca y Alimentación), *Statistical information.* Secretariat of Agriculture, Livestock, Fisheries and Food, 2009.

Senasa (Servicio Nacional de Sanidad y Calidad Agroalimentaria), *Manual de Procedimientos en Bienestar Animal.* Dirección Nacional de Sanidad Animal - Luchas Sanitarias, 2004. www.senasa.gov.ar

Senasa (Servicio Nacional de Sanidad y Calidad Agroalimentaria), 2009. www.senasa.gov.ar

USDA FAS, *Argentina retail food sector 2005.* GAIN Report AR5037. USDA Foreign Agricultural Service, 2005.

USDA FAS, *Argentina agricultural situation; Argentina imposes variable export taxes, raises duty on major commodities.* GAIN Report AR8013. USDA Foreign Agricultural Service, 2008.

WFB, *World Fact Book.* Central Intelligence Agency. www.cia.gov/library/publications/the-world-factbook> Date 12 October, 2009.

Appendix 1

Minutes of the Animal Welfare Workshop on 19 November 2009

'Animal Welfare: Argentina as a Stakeholder' WORKSHOP 19 November 2009

Attendees:

Frederik Vossenaar - Agricultural counselor, Netherlands Embassy
Peter Van Horne - LEI Wageningen UR
Mariët de Winter - LEI Wageningen UR
Sebastian Senesi - PAA FAUBA
María Mercedes Barilatti - PAA FAUBA
Marcos Daziano - PAA FAUBA
Monica Trujillo - PAA FAUBA
Dalila Corrales Martino - PAA FAUBA
Héctor Arbiza - Granja Tres Arroyos
Pablo Marsó - Avícola Las Camelias S.A.
Hugo A. Torno - Campo Austral
Daniel Fenoglio - Pacuca Sa
Luis Milán - Frigorífico La Pompeya SACIFYA
Juan Daniel Irigoyen - CODEPRA SA
Jorge Nazar - CAPIA
Maria Eugenia Figueroa - Fundación ArgenINTA
Mónica Ponce Del Valle - SENASA

Minutes

1. Sebastian Senesi opened the session by introducing the Food and Agribusiness Program, its relationship with the Netherlands Embassy in Argentina and also with Wageningen University. He pointed out the importance and impact of cooperation between these institutes. Regarding the Animal Welfare project, he stated that this was a first approximation to the issue in Argentina, in order to keep on working in the future. In relation to that, he said that the reason for having the workshop with selected people was to strictly discuss results and set future scope of research.

2. Frederik Vossenaar stated that Animal Welfare issues were of great importance to European and Dutch consumers in particular, to the point that at parliament there were political parties that based their agendas on initiatives regarding the matter. In relation to that, he mentioned that Animal Welfare should be studied, especially with its relation to Economics in order to make the activity more sustainable in the long term. He mentioned that the interest of the Netherlands is to start having stakeholders on this topic, reason why the research was made in Argentina.
3. Broiler Session - presented by Peter Van Horne (LEI Wageningen UR) and Mercedes Barilatti (PAA FAUBA)
 - a. Peter van Horne stated that recent animal welfare legislation for broilers in the EU is focusing on density, mortality and foot pad irritations. In terms of density broiler production in Argentina is far beyond the EU. The density of animals is low (average 10-11/square meter) in comparison to the EU and at the same productive systems in Argentina are often based on open housing with day light. The position on mortality and foot pad irritations in Argentina is not clear yet. Peter gave some examples of welfare improvements which can be economic for farmer or integrator.
 - b. Héctor Arbiza pointed out that the research had surpassed its expectations as it was a complex reality to summarise in a work of this sort. He mentioned that future projects should try to study the situations in different provinces deeply as broiler clusters were set in Entre Rios Province and Buenos Aires Province, and in third place in Cordoba province. He also mentioned that an issue that needed to further be studied was the environmental impact of the activity in terms of sustainability. Finally he said he disagreed with FABA (Argentinean Foundation for Animal Welfare) statements for broiler production, which were more related to *foie gras* production, activity which is banned in Argentina. Nevertheless, there were no people from the foundation at the meeting, so no further explanations on the matter were available.
4. Swine Session - presented by Mariët de Winter (LEI Wageningen UR) and Mercedes Barilatti (PAA FAUBA)
 - a. Mariët de Winter stated that in terms of Animal Welfare swine production in Argentina was good, especially taking into account that productive systems were based on open housing with day light, while in the EU it pigs are often kept in closed houses with artificial light. She said that on the other hand, prevailing housing of pregnant sows was individual, while in the Netherlands and in the EU, in a few years from now, it will be mandatory to use group-housing. She gave some examples of animal welfare

improvements which can be economic for the farmer. For larger production system improvements for animal welfare the cost will increase and a market bonus is needed to compensate for the additional cost. In the EU market there is a willingness to pay a bonus for higher quality and improved animal welfare.

- b. Daniel Fenoglio said that even though average results were subdivided in intensive systems (in stalls), extensive (open air) and mixed systems (both), the results of the study showed high dispersion because of the complex reality of the composition of the sector. Therefore, in order to study it deeply, further subdivision should be made, especially taking into account parameters as scale of production of existing firms.
 - c. At the coffee break, Luis Milan said that it was necessary to study transport to slaughtering, as it was a stage where animal welfare conditions were critics, mainly because it was done by contractors, and inappropriate management of the animals affected the final product.
5. Layers Session - presented by Peter van Horne (LEI Wageningen UR) and Marcos Daziano (PAA FAUBA)
- a. Peter van Horne described the current state of layer welfare in the Netherlands, where many farms use a floorsystem (either with or without an outdoor range). At the same time environment and foodsafety are important aspects for EU farmers. When hens are kept in enriched cages the space allowance has to be 750cm². In Argentina layers are kept in cages. In cages sanitary issues are easier to control. The space allowance in cages in Argentina is below the level EU mentioned in the EU legislation. However, Peter gave some examples for economic improvement of animal welfare (e.g. lower mortality and more space per hen in a cage). After implementation of new welfare regulations in 2012, the difference in production cost between the EU and Argentina will further increase. Also in egg production Argentina has changes to produce for the EU market. When the market needs are met additional cost for animal welfare can be compensated by a bonus on the market price. For this, an active market driven approach is necessary. Many Dutch farmers do this at the moment by working with floor systems which are above the minimum legislation level.
 - b. Jorge Nazar, Chairman of CAPIA expressed that he was very pleased with the outcome of this first piece of work and that CAPIA would support initiatives with a scientific background regarding Animal Welfare status. He said that they were concerned about initiatives that had no reliable proof but damaged the image of the activity. He also stated that as their

product was mainly directed to the domestic market, their industry was focused on keeping costs as low as possible.

6. At the end of the workshop, Frederik Vossenaar said that the Netherlands' Embassy was open to proposals from the industry to contribute and continue with the research.

For more Information please contact :

Ing. Agr. Ma. Mercedes Barilatti
Programa de Agronegocios y Alimentos
Facultad de Agronomía - UBA
Tel.:4524-2490/2499/9600/8041 int 111
Av. San Martín 4453 (1417)
barilatt@agro.uba.ar
agro.uba.ar/agroneg

Peter van Horne
Agricultural Economics Research Institute (LEI)
Wageningen, the Netherlands
peter.vanhorne@wur.nl
www.lei.wur.nl

LEI report 2010-005

