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SOCIOECONOMIC ASPECTS OF CAGE-FREE AND CRATE-FREE FARM ANIMAL PRODUCTION SYSTEMS

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Pirassununga, SP, Brazil

September 2022

ABOUT THE FORUM

The **Fórum Animal** was born out of Sônia Peralli Fonseca's empathy and compassion for animals. Icon in the history of Brazilian animal protection, the biologist began to structure the entity in 1998, registered two years later, with a group of partners of the cause in São Paulo. Since then, we have acted to ensure important advances for animals. Some examples are national legislation setting standards for humane slaughter; a nationwide ban on the practice of keeping marine mammals captive for entertainment; and the inclusion of animal cruelty or abuse as an environmental crime in Law 9.605/98 and in the Federal Constitution itself.

Our multidisciplinary team is made up of veterinarians, lawyers, marketing and communication professionals, geographers and researchers, who support the development of animal protection and defense actions.

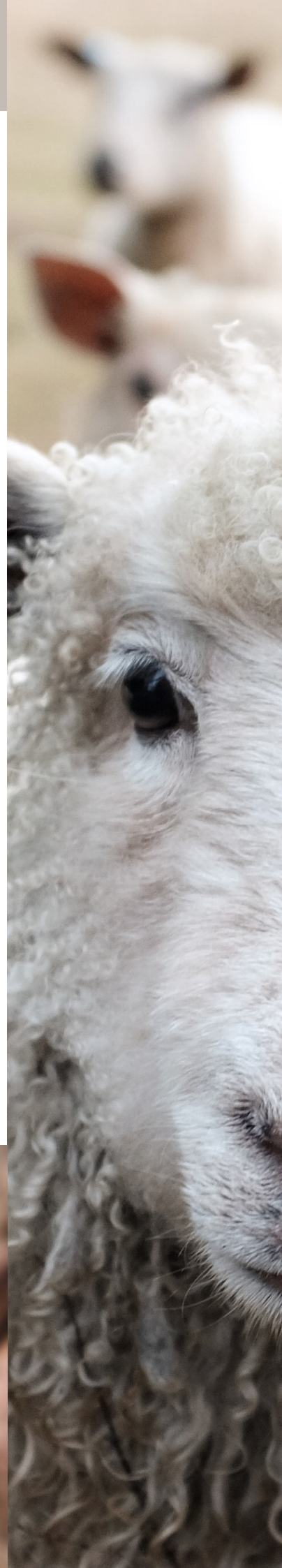
In addition to working with our 114 affiliates, which promote direct care for animals, we maintain a strong presence in the National Congress and Legislative Assemblies to influence the development of Brazilian public policies in favor of animals.

✉ info@forumanimal.org

🌐 forumanimal.org

📷 [forum.animal](https://www.instagram.com/forum.animal)

This material was reviewed and approved by Taylison Santos - Executive Director and Elizabeth MacGregor - President, both from Fórum Animal.



ABOUT THIS REPORT

This is the final report of the research we conducted for the Fórum Nacional de Proteção e Defesa Animal (Fórum Animal), sponsored by Tiny Beam Fund. The general aim of our partnership was to offer scientific expertise that could be used to improve Fórum Animal advocacy activities in relation to cage-free and crate-free farm animals production systems in Brazil.

THE AUTHOR

Mariana Bombo Perozzi Gameiro holds a M.Sc. and a Ph.D. in Sociology. She has engaged in post-doctoral research activities in the fields of Veterinary, Animal Science and Socio-Anthropology, in problematics related to animal welfare and human-animal relations. In addition, she works as a consultant to NGO's, governments and think tanks. Her professional career is dedicated to the social, political, economic, and environmental aspects of agriculture and animal value chains.

TINY BEAM FUND

The Tiny Beam Fund was formed to support a better understanding of and practical ways to address the multi-faceted problem which inflicts grievous harm on animals, people, and the environment. The fund sponsors research projects related to animal welfare, inspired and encouraged by how the data, evidence, and insights provided by academic researchers have proven to be remarkably useful in shedding light on highly complex social issues.



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AIMS AND METHODS

This report discusses some of the main socioeconomic aspects of cage-free and crate-free farm animal production systems in Brazil. Two main investigation lines were proposed, one focusing on the transition from a cage system for housing laying hens to a cage-free system; and the other focusing on the transition from sows' gestation crates to collective housing systems in pig farms.

The methodology consisted of qualitative semi-structured online interviews with seven key stakeholders in both eggs and pork sectors in Brazil, as well as literature review of scientific and grey papers. More than 150 documents (in Portuguese, English and French) were found and analyzed with the following keywords:

KEYWORDS

Free-range	Sows / gilts / pigs / swine
Chicken / broilers	Cage / stalls / crates / pens
caged laying hens / layer hens	Farrowing / gestation
Housing systems	Trade-off
Cage free system	Cost-Effectiveness Analysis
Alternative poultry (or egg) production systems	Outdoor raising
Economic analysis/performance	Conventional group housing
Cost-benefit analysis	Housing / husbandry
Animal welfare	Transition / conversion costs
Poules pondeuses	Cages (stalles) de gestation pour truies
livres de gaiolas (ovos ou galinhas)	Gestação de suínos / gaiolas

DATABASES: Springer, Elsevier, JSTOR, Taylor and Francis, etc

We approach the transition from traditional to cage-free and crate-free production systems in Brazil from a socio-anthropological point of view, emphasizing the social perceptions and representations of Brazilian stakeholders about such themes.

The report is organized around the topics that emerged as the most important issues mentioned by the social actors we interviewed during this research: workforce education and training; costs and market conjuncture; animals and people welfare; zootechnical performance and productivity, among others. Scientific evidence about important points of discussion is provided always that possible.



SYNTHESIS OF THE RESULTS

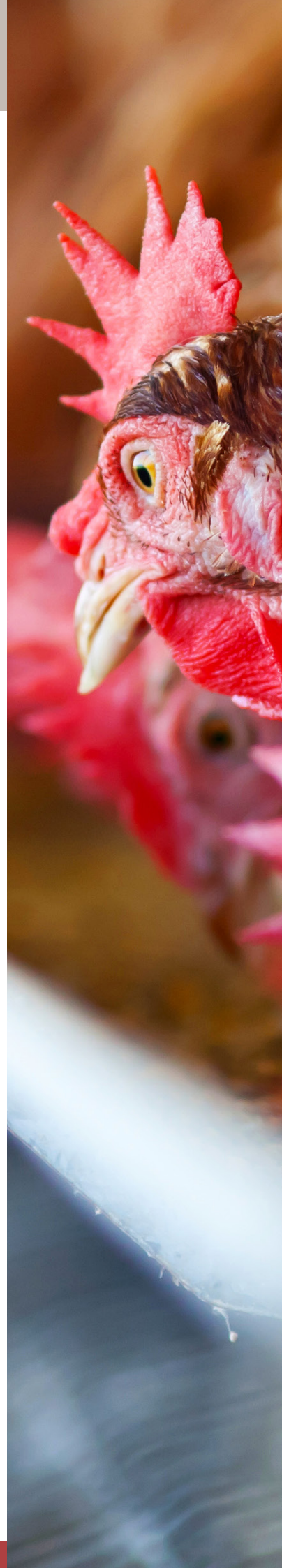
1. WORKFORCE EDUCATION AND TRAINING: the main point of attention in the transition and in the conduction of free-cage/crate systems is the level of training of the professionals involved in the activity (from ground level workers to veterinarians/technicians/consultants that assist producers and coordinate the process). Training regarding animal welfare and, particularly, knowledge on animal behavior seems to be determinant to succeed in the adoption of free- cage/crate systems – and this is not always observed in the Brazilian context, as many of the interviewees point out.

2. COSTS AND MARKET: to replace one producing system by another implies significant economic investment and this is mentioned as the main factor that prevent rural producers aware of animal welfare concerns from effectively engaging in this change. The situation is worsened by unfavorable market conjunctures, combining higher production costs and lower market prices paid to producers.

3. ANIMALS AND PEOPLE WELFARE: there is a general feeling that not only animal welfare is improved but also the wellbeing of people working directly in these systems. Consumers can also be added to this reasoning, if we consider that the consumption of products that are more aligned to their personal concerns (whether they are ethical, environmental, health, sanitary etc.) may increase their individual satisfaction¹.

4. ZOOTECHNICAL PERFORMANCE AND PRODUCTIVITY: zootechnical indicators may decrease in the initial phase after changing systems, while costs are higher due to investments made, reducing economic margins and zootechnical performance, at least until animals and people are adapted to it. Productivity can return to normal levels later and different techniques can be applied to mitigate problems. To be aware of this is very important as it may prevent farmers from abandoning alternative systems before the adjustment phase is completed.

¹ To measure consumers satisfaction, however, was not the aim of our research.



INTRODUCTION

THE BRAZILIAN CONTEXT

PRODUÇÃO DE CARNES BRASIL DE 2017 A 2020 (TONELADAS DE CARÇAÇAS) - IBGE

	BOVINOS	CRESC.	SUÍNOS	CRESC.	FRANGOS	CRESC.
2017	7.681.538		3.824.682		13.607.352	
2018	7.954.742	3,56%	3.950.759	3,30%	13.511.750	-0,70%
2019	8.218.851	3,32%	4.125.728	4,43%	13.516.525	0,04%
2020	7.824.888	-4,79%	4.482.048	8,64%	13.765.603	1,84%
2021	7.408.322	-5,32%	4.890.652	9,12%	14.615.320	6,17%
ACUMULADO 2021-2017		-3,56%		27,87%		7,41%

Source: ABCS, 2021².

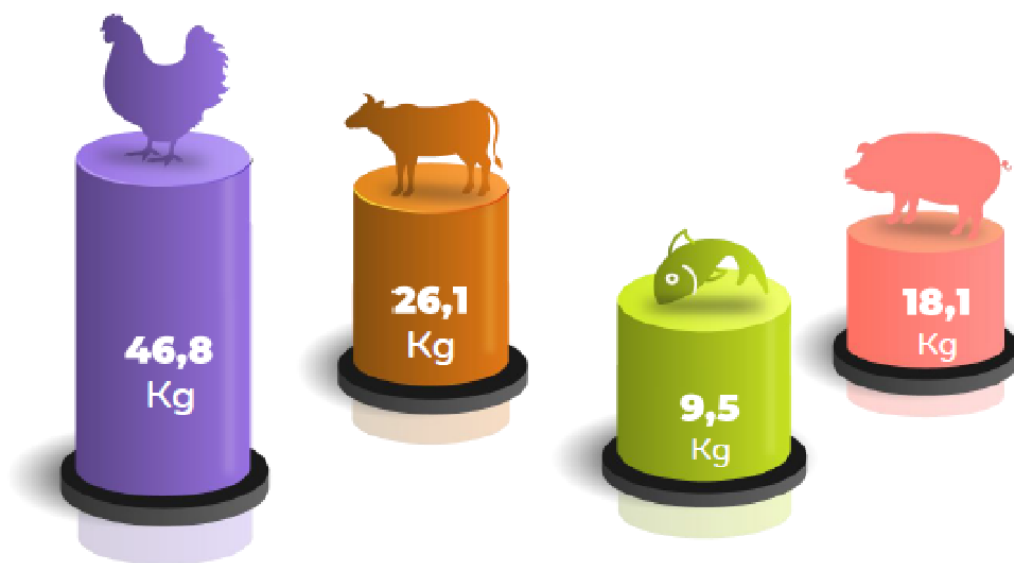
Almost 53 million pigs were slaughtered in 2021, according to IBGE (2022). The production is geographically distributed as follows: 67,5% in the Brazilian South; 17,5% in the Southeast region; 14% in the Center-West region; 0,9% in the Northeast region and 0,1% in the Brazilian North (ABCS, 2021³).

² Associação Brasileira de Criadores de Suínos (2021). Dados de Mercado de Suínos 2021. Available at: <https://abcs.org.br/dados-do-setor/>

³ Associação Brasileira de Criadores de Suínos (2021). Dados de Mercado de Suínos 2021. Available at: <https://abcs.org.br/dados-do-setor/>

Figure 1: Domestic protein availability in 2021 - and per capita/year consumption

DISPONIBILIDADE INTERNA DE PROTEÍNAS em 2021 (CONSUMO PER CAPITA/ANO)



Source: ABCS, 2021⁴.

Brazil is the 4th largest producer of pork meat in the world; China, European Union and the United States come first, Russia follows next. It is also the 4th largest exporter, behind the European Union, the United States and Canada (ABCS, 2021⁵).

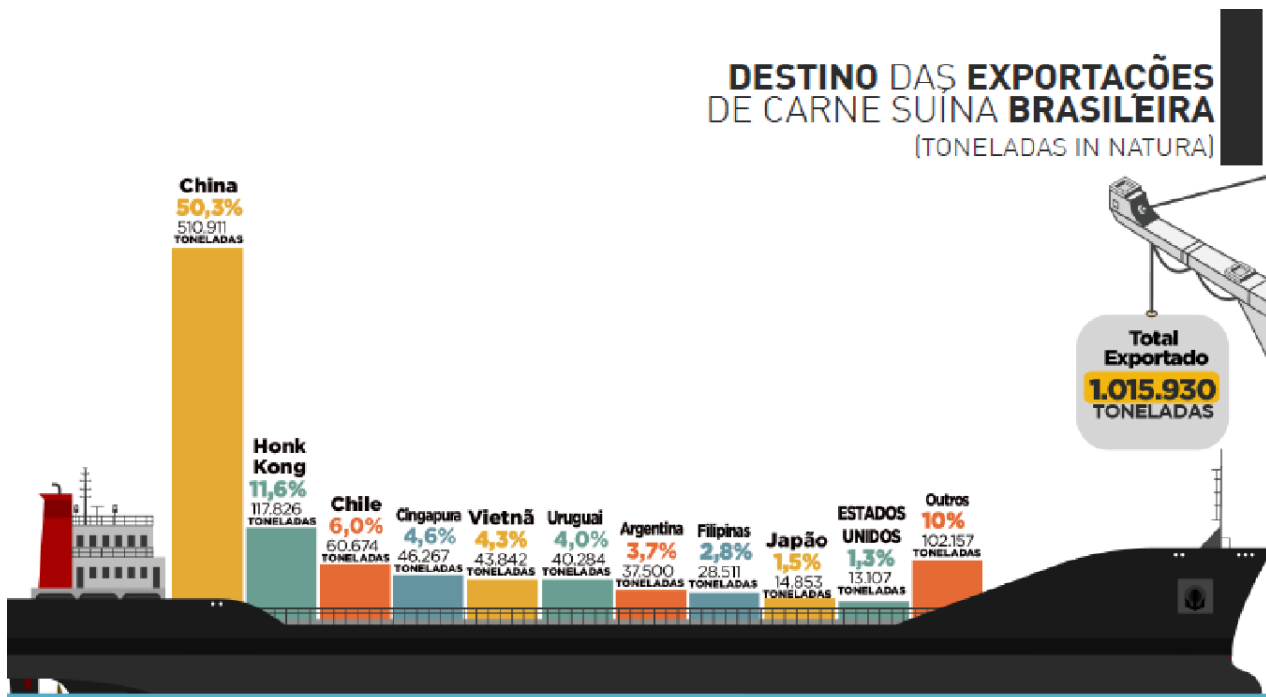
From all the national pork meat production, 75,8% goes to domestic market consumption and 24,2% is exported. The Brazilian consumption of pork meat was of 16,7 kilos per person in 2021 (ABPA, 2022⁶).

⁴ Associação Brasileira de Criadores de Suínos (2021). Dados de Mercado de Suínos 2021. Available at: <https://abcs.org.br/dados-do-setor/>.

⁵ Associação Brasileira de Criadores de Suínos (2021). Dados de Mercado de Suínos 2021. Available at: <https://abcs.org.br/dados-do-setor/>.

⁶ Associação Brasileira de Proteína Animal (2022). Relatório Anual 2022. Available at: <https://abpa-br.org/wp-content/uploads/2022/05/Relatorio-Anual-ABPA-2022-1.pdf>

Figure 2: Brazilian pork exports destination (tons in natura)



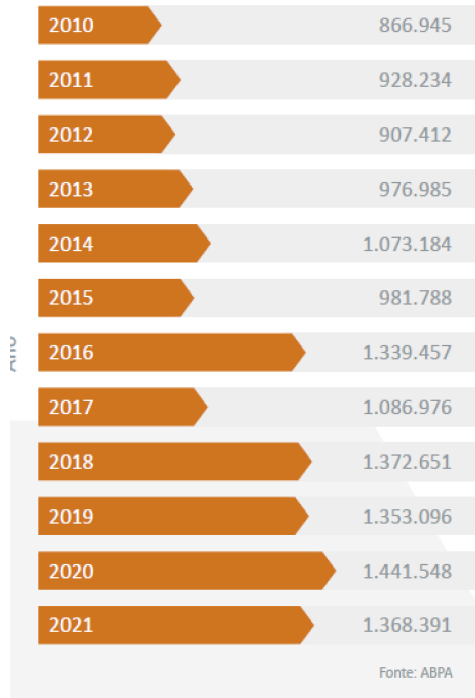
Source: ABCS, 2021⁷.

⁷ Associação Brasileira de Criadores de Suínos (2021). Dados de Mercado de Suínos 2021.

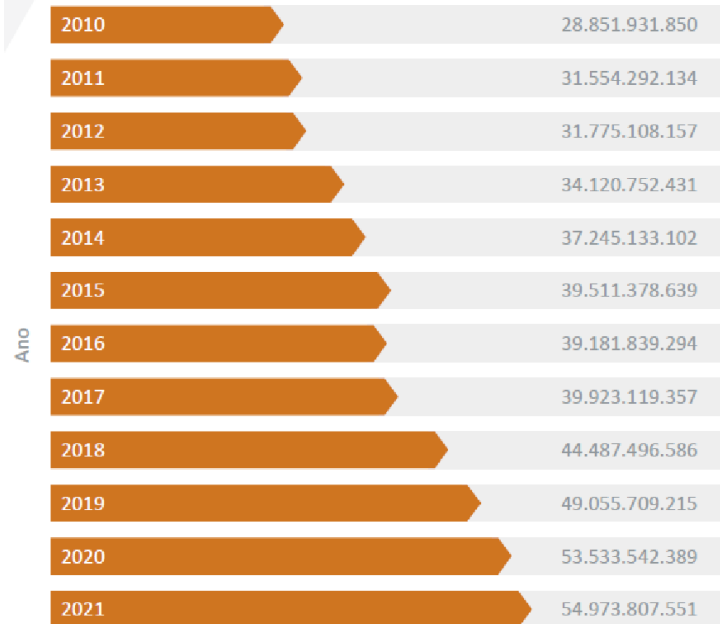
Available at: <https://abcs.org.br/dados-do-setor/>.



ALOJAMENTO DE MATRIZ DE POSTURA (Cabeças)



PRODUÇÃO BRASILEIRA DE OVOS (Unidades)

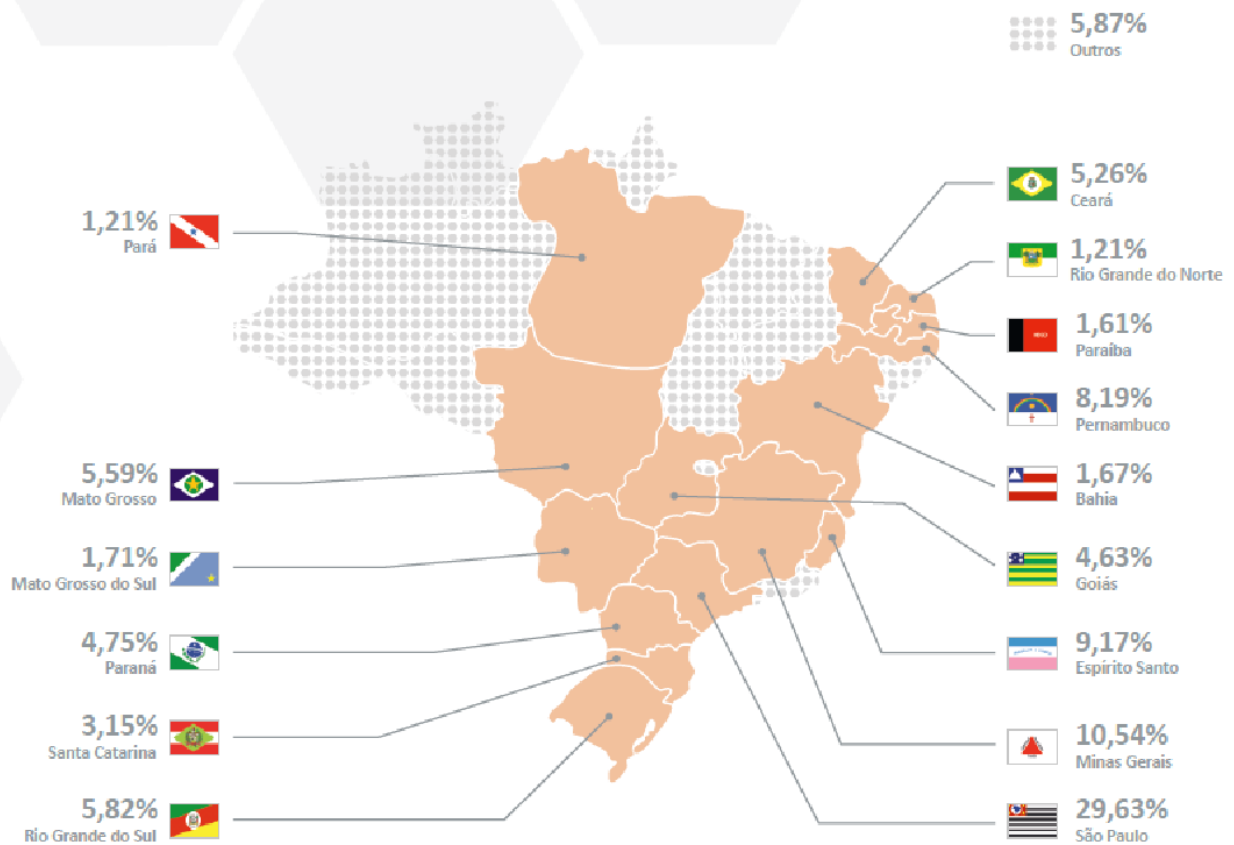


Source: ABPA, 2022⁸.

Brazil exports only 0,5% of the eggs it produces; 99,5% are consumed in the domestic market. In 2021, the consumption was of 257 eggs per person in the country, in comparison to 162 eggs in 2011, according to ABPA (2022).

⁸ Associação Brasileira de Proteína Animal (2022). Relatório Anual 2022. Available at: <https://abpa-br.org/wp-content/uploads/2022/05/Relatorio-Anual-ABPA-2022-1.pdf>.

ALOJAMENTO DE PINTAINHAS POR UNIDADE FEDERATIVA EM 2021



Source: ABPA, 2022⁹.

⁹ Associação Brasileira de Proteína Animal (2022). Relatório Anual 2022. Available at: <https://abpa-br.org/wp-content/uploads/2022/05/Relatorio-Anual-ABPA-2022-1.pdf>.



INTERNATIONAL CONTEXTS AND A SMALL HISTORY OF CAGES IN INDUSTRIAL ANIMAL FARMING

The intensive farming of animals in cages started in the end of World War II. It has allowed the increased consumption of meat, dairy and eggs. These products were moderately consumed before, but since then started to be abundantly available at relatively low prices to consumers.

In the last years, however, a new trend has arisen, with the awareness that production and consumption of animal-based foods needs to urgently reduce to limit irreversible environmental damage and to provide a sustainable food system. In addition, scientific evidence show caged animals are severely restricted in their movements and prevented from performing their natural behaviors, with detrimental effects on their health and welfare¹⁰.

¹⁰ Compassion on Animal Farming. Scientific briefing on caged farming. February 2021. <https://www.europarl.europa.eu/cmsdata/231963/Scientific%20briefing%20on%20caged%20farming,%20February%202021.pdf>.



European union farms hold up to 700 million farm animals, including hens, quails, rabbits, sows and ducks, confined in cages each year, according to the Eurogroup¹¹.

The European Union ban the use of barren battery cages since 2012, but over half of commercial egg-laying hens are still kept in so-called 'enriched' cages. While they do provide a nest, perches and some form of scratching material, these cages continue to severely limit hens' ability to carry out natural behaviors. Breeding flocks and chicks are also caged, often in barren cages, as they are not covered by specific legislation¹².

A partial ban on sow stalls came into force in 2013 in the EU. Sows are sometimes forced to live in metal cages for half their lives. The cages enclose their bodies, preventing them from walking or turning around. They just can stand or lie down, and are unable to properly care for their piglets. ¹³

In 2021, the European Commission announced the intention to introduce a ban on all farmed caged systems by the end of 2023. It will also consider measures relating to imports to the EU of products from caged systems. The legislative proposal is to phase out until 2027, and finally prohibit, the use of cage for animals already covered by legislation (laying hens, sows and calves), and to new ones (rabbits, pullets, layer breeders, broiler breeders, quail, ducks and geese)¹⁴.

¹¹ Eurogroup (s/d). Cages in animal farming. Latest access, 08 sept 2022. <https://www.eurogroupforanimals.org/what-we-do/areas-of-concern/cages-animal-farming>.

¹² Compassion on Animal Farming. Scientific briefing on caged farming. February 2021. <https://www.europarl.europa.eu/cmsdata/231963/Scientific%20briefing%20on%20caged%20farming,%20February%202021.pdf>.

¹³ Eurogroup (s/d). Cages in animal farming. Latest access, 08 sept 2022. <https://www.eurogroupforanimals.org/what-we-do/areas-of-concern/cages-animal-farming>.

¹⁴ BBC News. Caged animal farming: EU aims to end practice by 2027. Published 30 June 2021. Access 09 sept 2022.



In the United States, 95% of the farm animals are raised in factory farms. Approximately 9 billion chickens are slaughtered for their meat every year, while another 300 million chickens are used in egg production. Birds were excluded from all federal animal protection laws, but to date 14 states have created their own norms to protect hens. The US raises around 120 million pigs for food each year, the majority in barren crates or pens at industrial-scale facilities.¹⁵

LAYING HEN SYSTEMS

ENRICHED AND COLONY CAGES

BAD

Severely limit natural behaviours such as exercising and dust-bathing. Each hen has only slightly more space than an A4 sheet of paper.

BARNES

BETTER

Allow for some natural behaviours such as foraging, scratching and dust-bathing.

FREE RANGE AND ORGANIC

BEST

Allow a full range of behaviours with access to outdoor pasture and sufficient room for exercise.

Source: Compassion on Animal Farming, 2020¹⁶.

SOW SYSTEMS

INDOOR INTENSIVE

BAD

Use of sow stalls and farrowing crates, with zero enrichment and severe restriction of movement and natural behaviour.

HIGHER WELFARE INDOOR

BETTER

No use of sow stalls or farrowing crates. Sows are housed indoors in groups throughout gestation, and give birth indoors in pens in which they can turn around freely. Nesting material and bedding are provided.

FREE RANGE OR ORGANIC

BEST

Whilst there is no EU legal definition of free range regarding pigs, Member States are obliged to adhere to legislation regarding labelling claims and therefore labels denoting free range should provide outdoor access and would not normally use confinement systems like sow stalls and farrowing crates.

Source: Compassion on Animal Farming, 2020¹⁷.

¹⁵ American Society for the Prevention of Cruelty to Animals (2022). <https://www.aspc.org/protecting-farm-animals>.

¹⁶ Compassion on Animal Farming (2020). End the cage age. <https://www.ciwf.org.uk/media/7434596/end-the-cage-age-why-the-eu-must-stop-caging-farm-animals.pdf>.

¹⁷ Compassion on Animal Farming (2020). End the cage age. <https://www.ciwf.org.uk/media/7434596/end-the-cage-age-why-the-eu-must-stop-caging-farm-animals.pdf>.

LAYING HENS

LAYING HENS PRODUCTION SYSTEMS

- **Conventional battery cages:** after being born in hatcheries, undergoing the process of debeaking, and awaiting maturity (which usually takes about 18 weeks), laying hens are sent to the battery cages where they will spend the remainder of their lives - about two years.
- **Enriched cage system:** the environment is modified so that the birds have a little more chance of expressing their natural behavior. It offers nests and perches, as well as a bed for dust bath, but the space is still very limited.
- **Cage-free (floor) system:** hens are raised out of cages and do not have access to pasture, staying inside barns.
- **Free-range system (outdoors):** birds are raised free, with a feeding area, water, nests, perches and side exits for grazing areas, in addition to space for circulation. Adequate ventilation and lighting, floor covered with shavings, pine powder or rice husk are there so that the birds can express their natural behaviors, such as taking a sand bath.

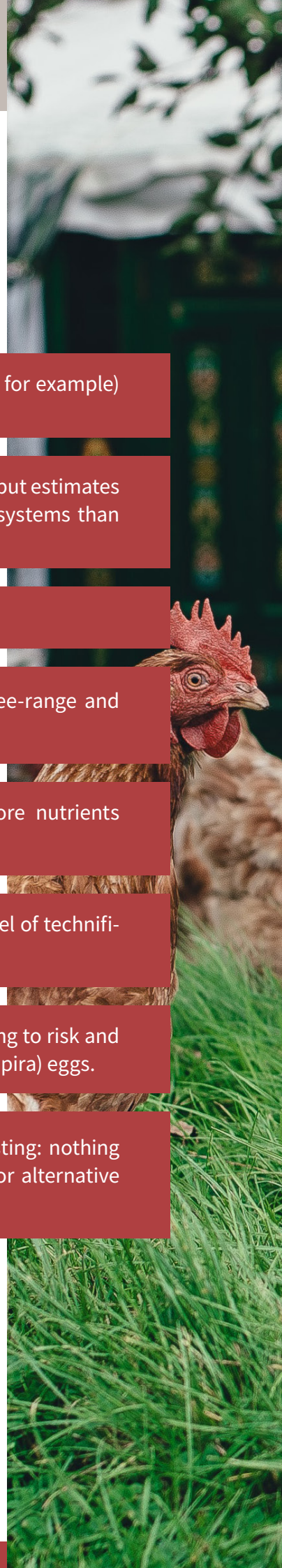


COSTS

MARKET PLAYERS' PERCEPTIONS¹⁸

- Different technological levels (from manual to automate egg collection, for example) are determinant for costs.
- Transition costs from traditional to alternative systems are very relative, but estimates indicate that eggs production costs are 25%-30% higher in cage-free systems than in traditional ones.
- Eggs production costs are 45% higher in organic (certified) systems.
- In order to balance costs and revenues, some companies combine free-range and traditional egg producing systems.
- Free-cage chickens have a higher energy expenditure and need more nutrients (daily intake) than caged ones, thus costs are higher.
- Workforce expenditures tend to be higher and vary according to the level of technification of the farm.
- If the required investment was not so high, most farmers would be willing to risk and diversify their products portfolio with alternative (free-cage, organic, caipira) eggs.
- The economic performance of free-cage farms is generally less interesting: nothing is cheaper than producing eggs in cages, but the consuming market for alternative eggs is growing.

¹⁸ According to the semi-structured qualitative interviews we conducted for the present research project.



SOME CLUES FROM SCIENCE¹⁹

Egg production has very heterogeneous costs, what leads to great oscillations of economic results and make it difficult to compare producing systems (Schwartz and Gameiro, 2017 ²⁰). Brazilian scientists estimated the costs of eggs in cage systems in 2017 at R\$ 0,18/per egg, and costs for free-range eggs at R\$ 0,26/per egg (31% higher) on average. Out of the total production costs of eggs, authors estimate that labor costs represent 7% and 12,7% in cage systems and free-range systems, respectively; energy and water represent 2% and 3,6%; feed 55% and 43,9%; hens health 1% and 3,8%; land 0,3% and 0,5%, in average. Despite the difference in costs, the wholesale prices for producers of eggs from caged hens significantly fluctuate during the year, and profitability is negative (meaning losses) in several months of the year. The fluctuation of prices of free-range eggs, in turn, is lower, and prices at retailers are 40% to 67% higher than the price of the traditional brown eggs produced in cage. “It can be seen that in both systems, a significant difference is linked to the efficiency, basically in connection with productivity, mortality and egg loss indices. The conclusion is that the handling and business management practices are actually the differentials in terms of feasibility and profitability of any of the systems” (Schwartz and Gameiro, 2017 ²¹).

In the United States, a study collected detailed data from two flock cycles from a commercial egg farm operating a conventional barn, a cage-free aviary, and an enriched colony system at the same location. They concluded that the cage-free aviary has average operating costs (feed, labor, pullet, energy, and miscellaneous costs that recur for each flock and vary with egg production) about 23% higher and average total costs about 36% higher compared with the conventional house. The enriched housing system has average operating costs only about 4% higher compared with the conventional house, but average total costs are 13% higher than for the conventional house. This study did not provide data on post-farm costs or on consumer prices (Matthews and Sumner, 2015 ²²).

¹⁹ According to scientific literature review conducted for the present research project.

²⁰ Schwartz, F., Gameiro, A. H. (2017). Cost-benefit analysis of egg production systems in cages (on battery) and without cages (free range) in the states of São Paulo and Paraná (Brazil). *Empreendedorismo, Gestão e Negócios*. 6(6), 132-147.

²¹ Schwartz, F., Gameiro, A. H. (2017). Cost-benefit analysis of egg production systems in cages (on battery) and without cages (free range) in the states of São Paulo and Paraná (Brazil). *Empreendedorismo, Gestão e Negócios*. 6(6), 132-147. *Empreendedorismo, Gestão e Negócios*. 6(6), 132-147.

²² W.A. Matthews, D.A. Sumner. (2015). Effects of housing system on the costs of commercial egg production. *Poultry Science*, v.94, 3, 1 March 2015, Pages 552-557. <https://doi.org/10.3382/ps/peu011>.



MARKET

MARKET PLAYERS' PERCEPTIONS

- It's necessary to have a clear vision of the consumer market: a strategy to position the product (cage-free egg) in nearby markets is fundamental to allow the farmer to continue in the free-range activity ("eggs are too perishable, without selling quick and having good margins the farmer will quit the free-cage system").
- The consumer market is growing, but it is not stable yet; attention to do not saturate it (expanding it too fast and too much).
- 50% to 60% of the producers who have chosen cage-free housing systems search for voluntary certification schemes; thus, they have to meet requirements linked to training and conscientization - and this ends up as a marketing tool.
- Consumers generally say they would be willing to pay more for free-cage eggs - the problem is that the Brazilian economy (in crisis and with inflation) does not allow this behavior.
- Farmers are not always convinced about the consumer markets' capacity of buying/absorbing (more expensive) alternative eggs.
- Experts advise small farmers to carefully study the local market potential for cage-free eggs before investing in it.



WELFARE

MARKET PLAYERS' PERCEPTIONS

- Adopting a free-cage housing system is good for the farm owner, who feels his business does good to animals and has the “clean conscience”. Future generations will also give it more value, so “it is not only about animal welfare, but it is equally a strategic market vision”.
- The professional and personal satisfaction of people who work with free-cage hens is higher, they are more sensible (“in a cold caged environment, people get cold too”) and touched by what they see (“organic soil has more life, dust baths are hearthwarming”).
- Animal welfare is an irreversible trend.
- In cages, there is a lower incidence of hens' broken bones, lower incidence of diseases and more productivity, but it doesn't mind: the animal is suffering, we just can't go on with that”.



SOME CLUES FROM SCIENCE

The shift to a housing system where laying hens are kept in larger groups and more complex environments has given rise to new challenges related to management, health, and welfare (Michel et al., 2022²³). Earlier studies have indicated higher rates of keel fracture, higher risk of infectious (bacterial and parasitic) diseases, cannibalism and mortality in floor-housed flocks compared to cage-housed flocks (Petrik et al., 2015²⁴, Fossum et al., 2009²⁵, Sherwin et al., 2010²⁶). Even so, they all highlight the benefits of non-cage housing systems, including increased opportunities to perform natural activities such as nesting, perching, foraging, and dustbathing. Most importantly, recent studies point out that as management and genetics evolves, alternative systems tend to find balance in health and welfare parameters. Today farmers have more tools to compensate for potential negative impacts.

Schuck-Paim et al. (2021²⁷) conducted a large meta-analysis of laying hen mortality in conventional cages, furnished cages and cage-free aviaries using data from 6040 commercial flocks and 176 million hens from 16 countries. They show that except for conventional cages, mortality gradually drops as experience with each system builds up: since 2000, each year of experience with cage-free aviaries was associated with a 0.35–0.65% average drop in cumulative mortality, with no differences in mortality between caged and cage-free systems in more recent

23 Michel V, Berk J, Bozakova N, van der Eijk J, Estevez I, Mircheva T, Relic R, Rodenburg TB, Sossidou EN, Guinebretière M. (2022). The Relationships between Damaging Behaviours and Health in Laying Hens. *Animals* (Basel). 2022 Apr 11;12(8): 986. doi: 10.3390/ani12080986. PMID: 35454233; PMCID: PMC9029779.

24 Petrik MT, Guerin MT, Widowski TM. On-farm comparison of keel fracture prevalence and other welfare indicators in conventional cage and floor-housed laying hens in Ontario, Canada. *Poult Sci.* 2015 Apr; 94(4):579-85. doi: 10.3382/ps/pev039. Epub 2015 Feb 22. PMID: 25713398.

25 O. Fossum, D. Jansson, P. Etterlin, I. Vagsholm. Causes of mortality in laying hens in different housing systems in 2001-2004. *Acta Vet. Scan.*, 51 (2009), pp. 3-12.

26 C.M. Sherwin, G.J. Richards, C.J. Nicol. Comparison of the welfare of layer hens in 4 housing systems in the UK. *Br. Poult. Sci.*, 51 (2010), pp. 488-499.

27 Schuck-Paim, C., Negro-Calduch, E. & Alonso, W.J. (2021) Laying hen mortality in different indoor housing systems: a meta-analysis of data from commercial farms in 16 countries. *Sci Rep* 11, 3052. <https://doi.org/10.1038/s41598-021-81868-3>.

years. “As management knowledge evolves and genetics are optimized, new producers transitioning to cage-free housing may experience even faster rates of decline. Our results speak against the notion that mortality is inherently higher in cage-free production and illustrate the importance of considering the degree of maturity of production systems in any investigations of farm animal health, behaviour and welfare” (Schuck-Paim et al, 2021²⁸).

Wurtz et al. (2021)²⁹ demonstrate the importance of considering the strain of bird selected for organic production systems in order for the birds to reap the potential benefits that are offered by outdoor access. According to them: “outdoor range areas provide laying hens with improved opportunities to perform natural behaviors and increase the available space per bird, however, birds are also exposed to potentially stressful factors including weather and predators (...) Ability to cope with challenging environments varies between different strains and must be considered to ensure good welfare”.

28 Schuck-Paim, C., Negro-Calduch, E. & Alonso, W.J. (2021) Laying hen mortality in different indoor housing systems: a meta-analysis of data from commercial farms in 16 countries. *Sci Rep* 11, 3052. <https://doi.org/10.1038/s41598-021-81868-3>.

29 Wurtz KE, Thodberg K, Berenjian A, Foldager L, Tahamtani FM, Riber AB. (2022) Commercial layer hybrids kept under organic conditions: a comparison of range use, welfare, and egg production in two layer strains. *Poult Sci.* 2022 Sep;101(9):102005. doi: 10.1016/j.psj.2022.102005. Epub 2022 Jun 13. PMID: 35841633; PMCID: PMC9293655.



Aware that some of the biggest welfare concerns in cage-free systems is the extent to which infectious diseases and severe feather pecking can occur, as well as the higher incidence of fractures incurred during the laying period, Hartcher and Jones (2017)³⁰ propose mitigation alternatives to cope with these risks. “The incidence of fractures may be addressed by good design, placement and management of structures in the shed. Genetic selection programmes should also be utilised to decrease the sensitivity of hens to osteoporosis and fractures. Similarly, the risk of severe feather pecking may be mitigated by good management practices including adequate diets, suitable environmental enrichment, minimising stress, matching the rearing and laying environments, and pairing this with genetic selection. The risk of infectious diseases may be mitigated by health management practices encompassing biosecurity, vaccination and hygiene programmes (Hartcher and Jones, 2017)³¹.

The main risks to hen welfare in cage-free systems are, at present, highly variable, and need to be addressed by management practices, robust welfare standards, genetic selection, and further research. Conversely, the extreme behavioural restriction that hens experience in conventional cages cannot be mitigated” (Hartcher and Jones, 2017)³².

30 K.M. Hartcher & B. Jones (2017) The welfare of layer hens in cage and cage-free housing systems, *World’s Poultry Science Journal*, 73:4, 767-782, DOI: 10.1017/S0043933917000812.

31 K.M. Hartcher & B. Jones (2017) The welfare of layer hens in cage and cage-free housing systems, *World’s Poultry Science Journal*, 73:4, 767-782, DOI: 10.1017/S0043933917000812.

32 K.M. Hartcher & B. Jones (2017) The welfare of layer hens in cage and cage-free housing systems, *World’s Poultry Science Journal*, 73:4, 767-782, DOI: 10.1017/S0043933917000812.



SANITARY ASPECTS

MARKET PLAYERS' PERCEPTIONS

- High-concentrated caged laying hens tend to present more respiratory diseases, while free-housing ones have more gastro-intestinal problems.
- In the free-cage housing system, the use of veterinary medicines is lower and for some diseases, the control can be made with natural products, organic acids, essential oils.
- Diseases can be detected earlier and easier, by watching animals.
- Biosecurity, control and cleaning activities are more demanding in cage-free systems.
- Parasites and ectoparasites require more attention in free-housing systems, mainly due to a closer contact with feces.



SOME CLUES FROM SCIENCE

The exposure of outdoor birds to predators, pathogens, and parasites is a critical issue. A recent review (Jeni et al., 2021³³) describes current research results in alternative systems by identifying how different poultry production operations (diet, environmental disruptive factors, diseases) impact the gastrointestinal ecology and health of the bird. Restrictions in treatment options can be a challenge, but interventions to limit diseases without using antibiotics could enhance both economics and sustainability in organic and free-range poultry production. The authors highlight that there are management options, such as pasture rotation, which can reduce exposure. Grazing preferences of birds toward certain aromatic plants may also provide reduction in exposure and/or limit the harm manifested by certain organisms. The crude extract of *Aloe secundiflora*, for example, provided effectiveness against *Salmonella Gallinarum* in experimentally infected free-range chicken and led to a decreased mortality rate (Waihenya et al., 2002). Phytogetic feed additives also offer promising potential for controlling some of pathogenic organisms and parasites, yet more research needs to be done (Jeni et al., 2021³⁴).

33 Rim El Jeni, Dana K. Dittoe, Elena G. Olson, Jeferson Lourenco, Darren S. Seidel, Steven C. Ricke, Todd R. Callaway (2021). An overview of health challenges in alternative poultry production systems. *Poultry Science*, v. 100, Issue 7, July 2021. <https://doi.org/10.1016/j.psj.2021.101173>.

34 Rim El Jeni, Dana K. Dittoe, Elena G. Olson, Jeferson Lourenco, Darren S. Seidel, Steven C. Ricke, Todd R. Callaway (2021). An overview of health challenges in alternative poultry production systems. *Poultry Science*, v. 100, Issue 7, July 2021. <https://doi.org/10.1016/j.psj.2021.101173>.

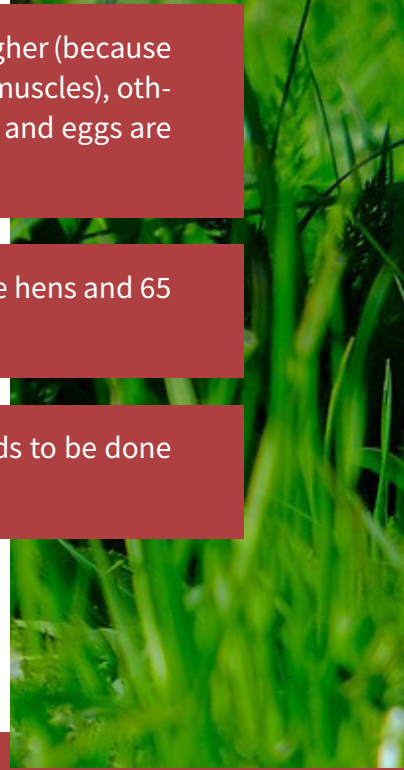
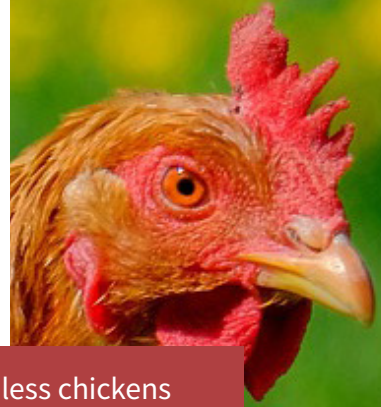


ZOOTECHNICAL INDICATORS/PERFORMANCE MARKET PLAYERS' PERCEPTIONS

- Individually, each free-range chicken produces more eggs (but there are less chickens per area in comparison to caged housing).
- Cage-free laying hens have a longer productive life (110-155 weeks, in comparison to an average of 90 weeks in traditional systems).
- Important losses may be associated to eggs laid outside nests (in the floor or litter) – it is necessary to teach the hen to lay its eggs in the appropriate place.
- Antimicrobial resistance should be better explored in order to convince farmers to adopt free-cage systems: free chickens need less antibiotics than those raised in cages – this argument is important in all systems where economic and zootechnical advantages are not easily seen.

EGG QUALITY MARKET PLAYERS' PERCEPTIONS

- Opinions diverge among stakeholders: some believe that egg quality is higher (because the chicken moves further and has a better development of bones and muscles), others that it is lower in a cage-free system (because the handling is higher, and eggs are more susceptible to damages).
- A decrease in eggshell quality would be seen after 90 weeks for cage-free hens and 65 weeks for traditional hens.
- Collecting eggs requires more attention in cage free systems and it needs to be done fast (1 hour, 1,5 hours after being laid).



SOME CLUES FROM SCIENCE

Despite the numerous publications, advantages and disadvantages of each production system in terms of egg quality remain controversial. Gautron et al. (2022³⁵) analyzed the various factors associated with egg quality attributes in relation to different housing systems for laying hens. They concluded that alternative systems have no impact on egg quality and meet the ethical needs of consumers, although they might have a negative impact on performance. “The most important factor of variation in the eggshell mechanical characteristics of eggs is definitely not the production system, but the genetics and feeding of the hens. Egg storage conditions of time and temperature are other important elements of egg quality and marketing”, authors say. “The most obvious conclusions concern the performance of layers, which is lower in alternative systems than in intensive systems, with results on nutritional qualities varying slightly in favor of extensive systems. Alternative systems have a positive effect on animal welfare, but with little or no impact on the quality of the egg product”, conclude Gautron et al. (2022³⁶).

Another study also points out that higher animal activity and competition for facilities may decrease laying performance in free-range aviary in relation to cage producing systems. A period of training and adaptation for hens, however, is likely to mitigate the problem, as there is a difference in egg productivity over time (Philippe, 2020³⁷).

35 J.Gautron, C.Dombre, F.Nau, C.Feidt, L.Guillier (2022). Review: Production factors affecting the quality of chicken table eggs and egg products in Europe. *Animal*, v. 16, Supplement 1, February 2022. <https://doi.org/10.1016/j.animal.2021.100425>.

36 J.Gautron, C.Dombre, F.Nau, C.Feidt, L.Guillier (2022). Review: Production factors affecting the quality of chicken table eggs and egg products in Europe. *Animal*, v. 16, Supplement 1, February 2022. <https://doi.org/10.1016/j.animal.2021.100425>.

37 F.X.Philippe, Y.Mahmoudi, D.Cinq-Mars, M.Lefrançois, N.Moula, J.Palacios, F.Pelletier, S.Godbout. Comparison of egg production, quality and composition in three production systems for laying hens. *Livestock Science*, v.232, February 2020. <https://doi.org/10.1016/j.livsci.2020.103917>.



A study evaluating the quality of marketed table eggs originating from enriched cage, barn, organic or free-range production systems concluded that table eggs from the free-range production system had the highest diameter, the lowest shape index and the highest frequency of normal-shaped table eggs, and the lightest shell colour. The highest shell thickness was found in eggs from the enriched cages, while the lowest shell thickness was found in eggs from the free-range production system. Table eggs from organic and free-range production systems had better internal quality and freshness. In conclusion, the authors state that table eggs from organic and free-range production systems are of better overall quality compared to those from enriched cage and barn production systems. (Čobanović et al., 2022³⁸). For Nys et al. (2018³⁹), the proportion of proteins, cholesterol, minerals, vitamins and sugars in the egg is not influenced by the production system.

38 Čobanović, Nikola et al. (2022) Assessment of marketed table egg quality originating from different production systems. *Meat Technology* 63 (2022) 1, 66–76. <https://doi.org/10.18485/meattech.2022.63.1.7>.

39 Y. Nys, C. Jondreville, M. Chemaly, B. Roudaut, V. Berthelot (2018). Qualité des oeufs de consommation. *Alimentation des animaux et qualité de leurs produits. Partie 2 - Déterminants alimentaires et non alimentaires en élevage de la qualité des produits (Chapitre 9)*, Tec & Doc Lavoisier, Paris, France (2018), pp. 316-333.

40 K.E. Anderson. Time study examining the effect of range, cage-free, and cage environments on man-hours committed to bird care in 3 brown egg layer strains. *J. Appl. Poult. Res.*, 23 (2014), pp. 108-115.



WORKFORCE AND EDUCATION

MARKET PLAYERS' PERCEPTIONS

- The main challenge is that a free-housing system requires more qualified and well-trained workforce.
- In the University the training in animal welfare is superficial; certifying institutions are better prepared and can offer training courses
- Broiler breeders are normally raised on the floor, so professionals who used to work on this activity are being recruited for jobs in cage-free farms.



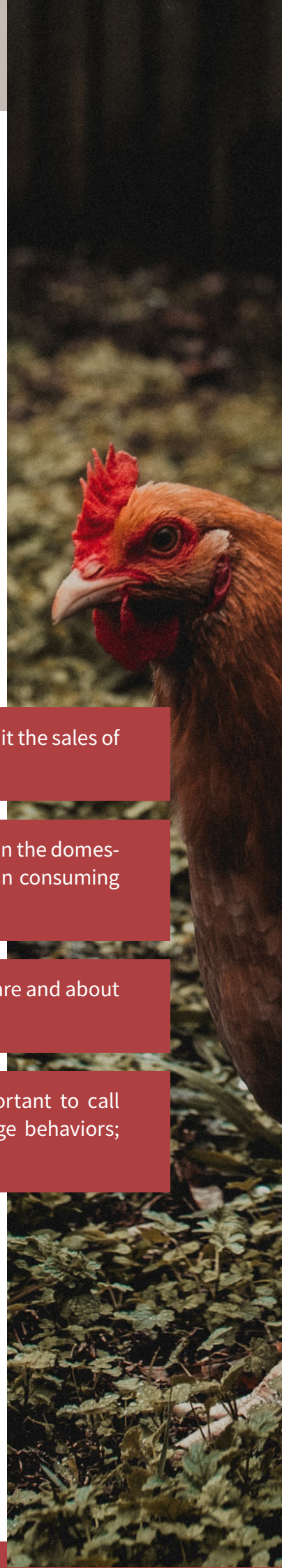
SOME CLUES FROM SCIENCE

Moving from intensive to extensive production systems required a 45% increase in time commitments from cage-to-cage free systems, as shown by an experiment in the United States. The man-hours needed for the care of hens in all of the production environments decrease as the hens age. Flock mortality resulted in increased labor per hen in the later periods of the production cycle. The strain of commercial laying hen or the use of a heritage breed may affect the man-hours per hen needed to care for the flock (Anderson, 2014⁴⁰). A newer study in the same laboratory confirmed that labor input was inversely related to bird stocking density, with intensive cage systems requiring the lowest labor per hour per hen and extensive range systems the highest (Brannan and Anderson, 2021⁴¹).

- Supermarket chains have already announced that after 2025 they will limit the sales of eggs produced in cage systems.
- International retail chains follow global patterns, it is an important force in the domestic market – but we cannot forget the low purchasing power of Brazilian consuming market.
- NGO's main role should be to educate the population about animal welfare and about the benefits of cage-free systems and eggs.
- The emotional appeal used by most animal protection NGOs is important to call attention, but its efficacy is momentaneous and not enough to change behaviors; critical thoughts and consumers education should be prioritized.

⁴⁰ K.E. Anderson. Time study examining the effect of range, cage-free, and cage environments on man-hours committed to bird care in 3 brown egg layer strains. *J. Appl. Poult. Res.*, 23 (2014), pp. 108-115.

⁴¹ Kelly E.Brannan, Kenneth E.Anderson. Examination of the impact of range, cage-free, modified systems, and conventional cage environments on the labor inputs committed to bird care for three brown egg layer strains. *Journal of Applied Poultry Research*, Volume 30, Issue 1, March 2021.



NORMS AND LAWS

MARKET PLAYERS' PERCEPTIONS

- Brazil lacks specific laws for cage-free systems.
- There are laws for egg processing, pasteurizing, sale to consumers; but alternative producing systems are barely regulated, mostly with voluntary suggestive patterns (instead of effective and concrete rules), and with no inspection/surveillance/control from federal, state or local public bodies.
- The “free-cage” name/label can be applied to a very large range of technical structures and conditions, which vary a lot (number of chickens per m², for ex).
- Labels and certifications are crucial in the Brazilian market to establish some homogeneity and to standardize different alternative systems.
- About 50% to 60% of the farmers who adopt free-housing systems look for animal welfare labels certification – and they are thus obliged to follow certain patterns and rules.
- Norms and patterns are dictated by ABNT (Brazilian Association of Technical Norms), not by the Ministry of Agriculture; they are voluntary, not very specific and must be paid to be accessed.
- The absence of more strict laws can lead to unfair competition in the market, with untrue package information (marketing) about alternative producing conditions.
- To evolve as a sector, it is fundamental to have rules for everybody to follow.
- Eggs are a key source of protein, mainly for the nutrition of middle and lower classes; so, besides animal welfare, human health and food security are taken into consideration by policymakers (the Ministry of Agriculture) when deciding about new rules and deadlines for hens production systems.

Box 1: Brazilian norms and laws directly or indirectly addressing laying hens welfare.

NORM OR LAW	TITLE	SUMMARY
NORMATIVE INSTRUCTION NO. 56, OF NOVEMBER 6, 2008 (Instrução normativa n. 56, de 6 de novembro de 2008)	Recommendations of Good Welfare Practices for Animals of Production and Economic Interest - REBEM	Generic legislation of 2 pages. Does not mention poultry specifically. Determines the creation of Manuals of Good Welfare Practices for each species.
Circular Letter No. 69/2019/DIPOA/ SDA/MAPA (Ofício-circula n.69 2019/DIPOA/SDA/ MAPA)	Caipira or colonial eggs	Determines that the ABNT standard is a reference for free-range farming. Makes it clear that it is not up to DIPOA (federal level) to inspect poultry farming, this task falling to state animal defense agencies – but they lack resources and are overloaded.
DECREE No. 9.013, OF MARCH 29, 2017 (Decreto n. 9.013, de 29 de março de 2017)	RIISPOA	Regulates Law No. 1.283, of December 18, 1950, and Law No. 7.889, of November 23, 1989, which provides on the industrial and sanitary inspection of products of animal origin. Had some changes in 2020, incorporated into the text. It is long and focus on welfare during the pre-slaughter and slaughter stages (practically no content regarding breeding).
ORDINANCE No. 365, OF July 16 2021 (Portaria n.365, de 16 de julho de 2021)	Technical Regulation for Pre-slaughter Handling and Humane Slaughter and stunning methods	It is not related to hens' production system, but address welfare issues.
CONTRAN Resolution 675 of June 21, 2017 (Resolução Contran 675 de 21 de junho de 2017)		Creates rules for vehicles transporting animals of production or economic interest, sport, leisure and exhibition. It is not related to hens' production system, but addresses welfare issues.

Source: compiled by a market player interviewed for this study.

PREGNANT SOWS

SOWS CAGES (CONVENTIONAL LARGE-SCALE INDUSTRIALIZED PIG PRODUCTION OPERATIONS)

- **Sow stall (insemination or gestation stall):** a narrow metal crate where a sow is confined in for up to five weeks around early pregnancy. Gestation crates are placed side by side in long rows; they are only slightly larger than the animals themselves.
- **Farrowing crate:** a narrow metal crate where a sow is confined in from a week before she gives birth (farrows), until her piglets are weaned at 21-28 days old. This is similar to a sow stall except that there is space to the side for the piglets. Bars keep the sow out of the piglets' lying area to prevent crushing. Once released, they are re-inseminated and the caged cycle begins again.

ALTERNATIVE SYSTEMS

- **Indoor systems - group housing pens:** it is the most basic alternative and implies in moving the sows out of gestation crates. They are kept in groups on solid floors with straw or other material for bedding and rooting. Group housing designs vary by pen layout, group size, and method of feed presentation.
- **Outdoor bred:** sows are kept outside with straw-filled huts for shelter: this is where they will give birth to their piglets (without sow stalls or crates). Sows can build nests, root, wallow and forage. At weaning, the piglets are taken indoors and reared in extensive or intensive conditions.
- **Outdoor reared:** piglets are born outside, without stalls or crates, and spend half of their lives outside.
- **Free-range systems:** free-range pigs have permanent access to pasture. They are born and reared outside throughout their lives. Tail-docking is normally not used.



COSTS

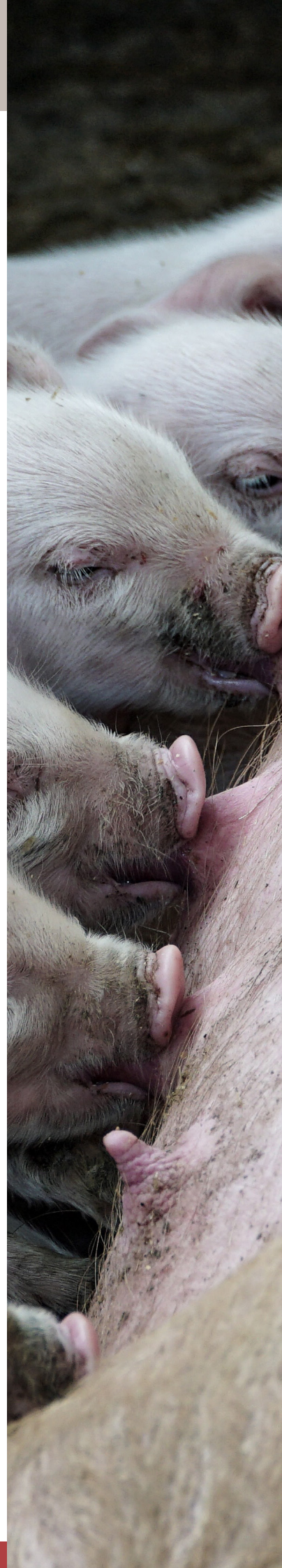
MARKET PLAYERS' PERCEPTIONS

- Discussion about to change or not from individual to collective gestation systems is over (it happened about five or six years ago); the need of transition is consolidated, the question now is “how to do it, which is the best (crate-free) model and how are we going to pay for it”.
- Farmers can use the “crate-free” as publicity/marketing tool, which is particularly interesting for large pig companies having opened capital (in stock markets).
- Transition costs vary significantly because of the large diversity of systems and technology levels (minibox is the most common system in Brazil).
- Some estimate that in crate-free systems, the costs are 10 to 15% higher than in conventional ones.
- Transition costs are estimated at 4 to 5 thousand reais per housed animal when changing from conventional stalls to a mini-box system (attention: costs may vary according to the situation).
- Older farms generally have more space than newer ones, so less changes are necessary when transitioning systems for pregnant sows; even so, costs are the main bottleneck.
- Labor costs will not be necessarily higher in crate-free housing, it depends on the system adopted.

SOME CLUES FROM SCIENCE

A study compared the production costs of unweaned piglets in a gestation system with conventional cages (where sows remain during all gestational period) and in collective stalls (with sows housed in cages for artificial insemination and then moved to collective stalls), in the state of São Paulo. The same productive performance was considered for both systems. Out of the total costs, variable costs represented 79,4% in the cage system and 78,9% in collective stalls; fixed costs represented 18,7% and 19,2%, while rent factors answered for 1,97% and 1,96% respectively. The total cost per kilo of piglet produced was 4.54 reais (Brazilian currency) in conventional cages and 4.59 reais in collective stalls. Feed costs was the one that most impacted the total costs (about 71%). The study also evaluated the economic profit per kilo of piglet: 11,71 reais in conventional cages and 11,67 reais in collective stalls. Under the conditions studied, the cost of the piglets produced in collective stalls was 1.10% higher than piglets produced in conventional cages; however, the profit margin for the collective stall system was 69%, demonstrating the economic feasibility of this housing system for swine sows. Authors conclude that “to ensure the welfare and productive performance of the sows, it is not enough to implement collective gestations, it is also necessary to adapt management practices and technologies, to ensure similar zootechnical indicators between the systems” (Alves et al., 2020⁴²).

⁴² Alves, L. K. S., Raineri, C., Gameiro, A. H., & Pospissil, C. A. (2020). Matrizes suínas gestantes alojadas em baias coletivas ou em gaiolas individuais: impacto no custo de produção de leitões. XIV Simpósio de Pós-Graduação e Pesquisa em Nutrição e Produção Animal – VNP/USP; I Simpósio Internacional da Pós-Graduação. https://posvnp.org/wp-content/uploads/2021/05/MATRIZES-SU%C3%8DNAS-GESTANTES-ALOJADAS-EM-BAIAS-COLETIVAS-OU-EM-GAIOLAS-INDIVIDUAIS-IMPACTO-NO-CUSTO-DE-PRODU%C3%87%C3%83O-DOS-LEIT%C3%95ES_Laya_Kannan.pdf



MARKET

MARKET PLAYERS' PERCEPTIONS

- Companies adopting crate-free models have economic gains in the medium-long term.
- It's important to educate consumers and to have a clear message about animal welfare in the meat pack; otherwise, demand is not going to increase, and farmers will not be properly remunerated.
- The Brazilian (and the international) economic situation is critical, so the moment is not appropriate to push farmers too hard.
- In the next two years, small evolutions are expected to be seen (in terms of farmers' adherence).
- In general, the interest of independent farmers in São Paulo and Minas Gerais states for changing from crate to crate-free systems is lower than in Brazil's Southern region (Rio Grande do Sul, Santa Catarina, Parana states). In this region, the majority of farmers are vertically integrated to meat processing plants, who made commitments to end the use of gestation crates in their supply chain. The pressure for changes on Southern farmers, thus, is stronger.
- The remuneration for piglets born on crate-free systems is not higher than the remuneration for animals from conventional systems in Brazil; certification may add value to pigs' prices due to other factors, like organic production, lower use of antibiotics, and so on.

WELFARE

MARKET PLAYERS' PERCEPTIONS

- The expression of natural behaviors allows social interactions between animals; walking and moving freely strengthen muscles and facilitates farrowing).
- Crates and stalls generate an incomplete social interaction.
- But even in group housing systems, sows may not express all of their natural behaviors, because they may live on floors (not pasture) and be placed in pens during the farrowing phase (preventing them from making nests).
- Consumers tend to see animal welfare as farmers' responsibility, a kind of obligation; therefore, farmers do not need to be better remunerated for this.
- Pigs frequently reorganize hierarchies, so a crate-free system must be very well planned with scape areas, resting areas, etc, and a careful schedule for inserting new members into the group - otherwise they can have aggressive behaviors and sows welfare may even get worse.
- People, particularly farmers, are getting aware of animal welfare, and they do not oppose or resist to this ("nobody wants to see an animal suffering"); the resistance is linked to the economic aspect (currently very high production costs, important transition costs and decreasing market prices: "as a company, you must work with the idea of profits in mind").
- Pregnant sows welfare is usually seen as a matter of space, but there is much more than that to observe (access to food, to water, rest, stress and health conditions, etc).

SOME CLUES FROM SCIENCE

When deciding whether to invest in an improvement to animal welfare, farmers must trade-off the relative costs and benefits, taking into account the existence of many effective solutions to animal welfare issues. A study modelled UK and Irish pig farmers' decisions to improve animal welfare. They were asked to choose between hypothetical control strategies to alleviate aggression between growing/finishing pigs at regrouping. Results revealed three independent classes of farmers. "Farmers in Class 1 were unlikely to regroup unfamiliar growing/finishing pigs, and thus were unwilling to adopt measures to reduce aggression at regrouping. Farmers in Classes 2 and 3 were willing to adopt measures providing certain pre-conditions were met. Farmers in Class 2 were motivated mainly by business goals, whilst farmers in Class 3 were motivated by both business and animal welfare goals and were willing to pay the most to reduce aggression". Authors conclude that "farmers were heterogeneous in their preferences and willingness to pay for additional aggression control strategies to use when regrouping unfamiliar growing/finishing pigs. Overall, the results suggest that farmers should not be considered a homogeneous group regarding the adoption of animal welfare innovations and that researchers should target subgroups of farmers with campaigns tailored towards their preferences and willingness to pay" (Peden et al., 2019⁴³).

43 Peden RSE, Akaichi F, Camerlink I, Boyle LA, Turner SP (2019) Pig farmers' willingness to pay for management strategies to reduce aggression between pigs. PLOS ONE 14(11): e0224924. <https://doi.org/10.1371/journal.pone.0224924>.



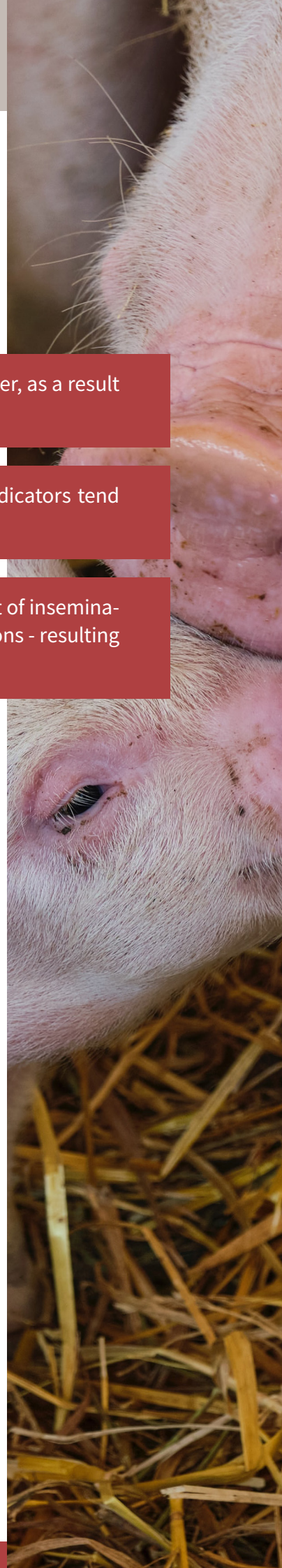
ZOOTECNICAL INDICATORS/PERFORMANCE MARKET PLAYERS' PERCEPTIONS

- Important losses will happen when sows housed in group fight each other, as a result of bad managing practices and misunderstandings about their behavior.
- Until the females are readapted to the new system, all zootechnical indicators tend to drop.
- In the transition phase, 1/3 of the sows' annual cycles (from the moment of insemination to the farrow) may be lost due to reproductive problems - as abortions - resulting from hierarchical disputes.

SOME CLUES FROM SCIENCE

The idea that crates lead to lower sow mortality and higher piglet outputs per sow by facilitating health monitoring and preventing aggression has been tested by Schuck-Paim and Alonso (2022). They used publicly available data from a network of pig production economists in 17 countries, focusing on the last five years (2015-2019). Results indicate that sow mortality was significantly higher, and annual pig production per sow significantly lower, in the crate system than in the restricted group (countries where gestation crates are restricted to four weeks after insemination). They conclude: “claims of higher mortality and reduced productivity per sow in crate-free systems are not substantiated by this industry-validated dataset. While many factors differ among the country groups (e.g., genetics, nutrition, climate), the observation that factors other than crating have a greater influence on performance challenges claims of an overall negative effect of loose housing on the parameters investigated. This evidence should be considered in policies affecting the welfare of breeding pigs” (Schuck-Paim and Alonso, 2022⁴⁴).

⁴⁴ Cynthia Schuck-Paim, Wladimir J. Alonso (2022). Productivity of mother pigs is lower, and mortality greater, in countries that still confine them in gestation crates. *F1000Research*, 11, 564 - August 2022. <https://doi.org/10.12688/f1000research.122042.2>.



Addressing other factors than economic ones, Schwarz et al. (2021) affirms that the selection of appropriate housing conditions for sows is critical for their physical health and long-term reproductive success. They evaluated the influences of housing system postweaning in individual stalls or group pens, the season and the parity on piglet productivity of sows in a commercial setting. Considering that both housing systems have their pros and cons, their results indicate that, in commercial settings, group housing postweaning improved nearly all reproductive parameters of sows.

The challenges, however, cannot be forgotten. A study reviewed the international scientific literature to establish current knowledge regarding welfare, biosecurity, animal health and pork safety in alternative farming system. “In general, alternative farms give pigs the opportunity to express a broader range of behaviours than conventional farms. However, the management of feeding, watering, temperature and predators is often more complicated in these outdoor systems. In addition, biosecurity measures seem to be applied less strictly in alternative farms than in conventional farms, especially in free-range systems, where they are more difficult to implement. On the other hand, pigs kept in these farming systems seem to be less affected by respiratory diseases, but parasitism and piglet crushing (in farrowing units) both remain a real challenge” (Delsart et al., 2020⁴⁵).

45 Maxime Delsart, Françoise Pol, Barbara Dufour, Nicolas Rose, Christelle Fablet. (2020). Pig Farming in Alternative Systems: Strengths and Challenges in Terms of Animal Welfare, Biosecurity, Animal Health and Pork Safety. *Agriculture* 2020, 10, 261; [doi:10.3390/agriculture10070261](https://doi.org/10.3390/agriculture10070261).



WORKFORCE AND EDUCATION

MARKET PLAYERS' PERCEPTIONS

- Crate-free systems are more demanding and difficult, they require knowledge about sows and pigs behaviors when they are walking free or housed in crates.
- After costs, the lack of training/education is the second main bottleneck in the transition towards group housing systems.
- In a diverse and rich environment, if one doesn't know well about animal behavior, management/handling problems may arise and it will be very hard to solve them.
- Collective gestation systems demand more knowledge and control – but it does not mean that the workload is higher.
- Everyone responsible for the contact with animals must be trained to understand what animals are needing of.
- Vets and technicians are generally too focused on conventional intensive producing systems and lack practical and theoretical knowledge about ethology.
- The most important in the transition of systems is the distribution of employees and the quality of human-animal interaction.
- Transition might not succeed well if professionals are not aware of animals needs and behaviors.
- The lack of information leads to uncertainty and blocks actions (towards better welfare practices); due to this, education is very important.
- Universities lack courses and disciplines about animal welfare, and a large part of professors do not feel ready to teach it in a practical way.

- Professionals (veterinary, technicians, and others) who collaborate to the transition to crate-free systems must be aware of the risks and must know how to reduce them, in order to prevent farmers from regretting or from giving up.
- Farmers in vertical integration with the agroindustry have more frequent and steady access to technical assistance, favoring the shift and the maintenance of alternative systems - in opposition to independent farmers who generally rely on sporadic consultants dedicated to issues like nutrition or health or eventually welfare.
- In pig farms, younger people tend to be more open to the idea of collective gestation systems, because they see benefits to the animal and market advantages (transition costs also tend to be lower in newer infrastructures).
- People working with conventional individual systems for a longer time tend to be more resistant: they believe the female is doing good in stalls, where individual treatment can be better done, and management is easier. Besides, old infrastructures tend to require more investment to be adapted to collective gestation housing.
- Veterinaries and animal scientists sometimes agree with many unacceptable practices, but when they realize that animals have feelings (sadness, joy, etc), they may change.



SOME CLUES FROM SCIENCE

Based on observations of an introductory Animal Science course on-site at a land-grant university's farming facilities, Poirier (2020⁴⁶) examines how animal welfare is constructed in order to socialize students into a discipline and eventual occupation. "Attention is paid as to how animal scientists construct animal welfare through various forms of pedagogy that juxtapose welfare with captivity, confinement, research interests, profit, and social acceptability. Observations suggest that animal welfare is constructed as control over animals and the assurance that this control is humane. The dual mechanisms of control and comfort socialize students to raise animals for slaughter and not see this process as violent", concludes Poirier (2020).

46 Nathan Poirier (2020). Learning to Exploit: The Socialization of Animal Science Undergraduates. *Sociological Inquiry*, 91(4), 940-961 - July 2020 <https://doi.org/10.1111/soin.12380>.



Ryan et al. (2015)⁴⁷ point to public opposition to the use of gestation stalls, and indicate that the more the public learns about gestation stalls, the less willing they will be to accept their use. In their study, initially 30.4% of respondents indicated that they supported the use of gestation stalls; this declined to 17.8% after participants were provided additional information.

Investigating Brazilian citizens' attitudes towards three farrowing housing systems (crates, loose pens, and outdoors), researchers obtained data via an online questionnaire. According to the authors: "participants overwhelmingly rejected the use of farrowing crates, and most supported a proposal to move from farrowing crates to loose pens, even animal welfare through various forms of pedagogy that juxtapose welfare with captivity, confinement, an increased risk of piglets' mortality. Participants' views were underpinned by concerns about sows' freedom of movement, behavioral freedom and naturalness, and the belief that it is possible to develop and manage housing that prevents piglet crushing that does not involve confining the sow. Furthermore, loose farrowing pens may not fully address all concerns expressed by participants regarding farrowing housing, which included the possibility of allowing sows to socialize and express maternal behaviors. We conclude that maintaining farrowing crates may erode the pig industry's social license"⁴⁸

⁴⁷ E. B. Ryan, D. Fraser, D. M. Weary. Public Attitudes to Housing Systems for Pregnant Pigs. PLOS ONE, 10(11), e0141878 - November 2015 <https://doi.org/10.1371/journal.pone.0141878>.

⁴⁸ Vandresen, Bianca; Hötzel, Maria José (2021). "Mothers Should Have Freedom of Movement"—Citizens' Attitudes Regarding Farrowing Housing Systems for Sows and Their Piglets. *Animals*, 11(12), 3439 - December 2021. <https://doi.org/10.3390/ani11123439>.



ROLE OF OTHER ACTORS (SUPERMARKETS AND NGOS)

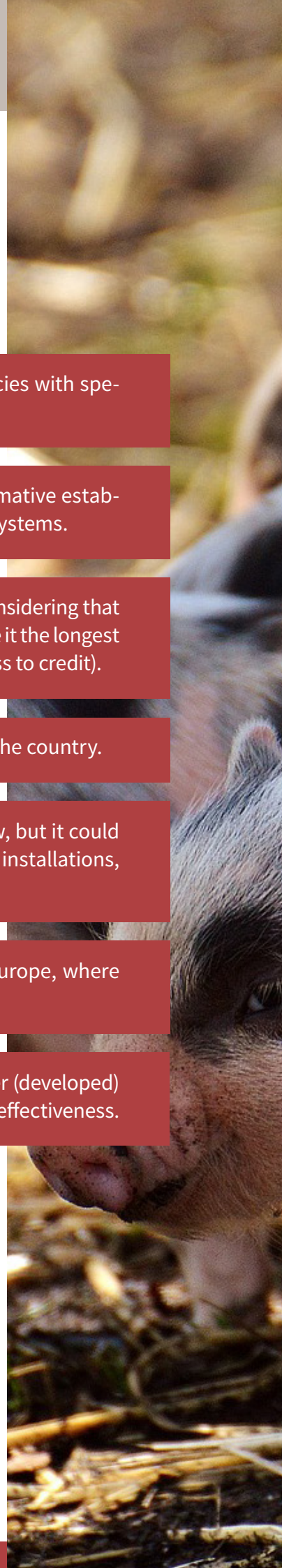
MARKET PLAYERS' PERCEPTIONS

- NGOs are doing their job to rise attention to sows' welfare issues, but they need to make more noise.
- The government should make credit lines (loans) available to farmers willing to shift systems (today, only farmers with new installation projects have access to the available credit lines - transition projects with the reform of physical structures are not covered).
- Countries where the transition towards alternative systems is advanced count on the active support of governments.
- NGO's could help farmers to get financial aid to change to better pregnant sows housing conditions, working with the government for making credit lines available, for example.
- The agrifood-industry has publicly committed to stop selling meat products that do not respect animal welfare; therefore, they make a big pressure on farmers and drive them to shifting practices.
- (Exporting) meat processors anticipate the deadline given by Brazilian legislation because they need to meet external market criteria.
- Exporting meat processors are also under the external market pressure.
- All stakeholders must be articulated and coordinated for the transition; for now, communication is still weak among them (specially between NGOs and farmers).
- NGOs should not work on the "attack", but instead in the "search for solutions"; they should try to help, instead of just criticizing.
- The lack of public policies and financial aid for farmers willing to shift systems is one of the main difficulties faced by them.

NORMS AND LAWS

MARKET PLAYERS' PERCEPTIONS

- IN 113 is the normative in effect for sows welfare (pigs are the only species with specific welfare norms in Brazilian laws).
- Transition is happening in Brazil even if the Ministry of Agriculture's normative establishes many years from now (up to 2045) for changing sows gestational systems.
- Considering animal welfare, 2045 is too far as a limit to ban crates, but considering that costs are high and that pig production aims to profit, farmers will postpone it the longest they can, specially small-scale ones (large-scale farmers have easier access to credit).
- Brazilian animal welfare laws were a great step to animal production in the country.
- The deadline of 2045 to ban gestation crates in Brazil is too far from now, but it could not be shorter than this due to the absence of credit, the depreciation of installations, and the market crises (higher costs associated to lower prices).
- Animal welfare legislation in Brazil cannot be compared to that from Europe, where the public debate on this subject is much older.
- Yet, Brazil has some laws and norms that are more advanced than in other (developed) countries: it is necessary to watch for their compliance and to control their effectiveness.



The Normative Instruction n.113 was published by the Ministry of Agriculture, Livestock and Supply (MAPA) at the 18th December 2021.

It is Brazil's first swine welfare legislation and establishes good management practices and animal welfare on commercial breeding farms.

MAIN CHANGE

TO BE ADOPTED UNTIL

Mandatory use of collective gestation for sows; maintenance in individual stalls limited up to 35 days of gestation

01/01/2045

Average age at weaning: 24 days or more

01/01/2045

Surgical castration with anesthesia and analgesia (immunocastration is accepted without restrictions)

01/01/2030

Banning of mousing

01/01/2030



CONCLUSIONS AND RECOMMENDATION

In order to foster and assist rural producers in the transition towards alternative production systems, to learn about the social representations build around the subject is fundamental. Brazilian market players' perceptions regarding the benefits and the challenges associated to free-cage and free-crate housing systems for laying hens and pregnant sows indicate us the main points of attention for organizations working to promote better animal welfare conditions.

The **workforce education and training** are still considered a very critical aspect in this context. The level of training of the professionals involved in the activity (from ground level workers to veterinarians/ technicians/consultants that assist producers and coordinate the process) needs to be improved, mainly when it comes to **animal behavior**. **Enhancing the teaching of animal welfare sciences (including ethology and human-animal relations) in universities, but also making available courses and educational materials for a broader audience** can consistently help in the success of the adoption of free-cage/crate systems.

High economic investments for replacing conventional producing systems by alternative ones are mentioned as the main factor that prevent rural producers who are aware of animal welfare concerns from effectively engaging in this change. The situation is worsened by unfavorable market conjunctures, combining higher production costs and lower market prices paid to producers, as it is the case for the Brazilian swine market for the past two years. Therefore, to have a good estimate of **transition costs** and to be able to identify adequate **market conditions** are very important. Providing **credit lines** and improving the access of rural producers to financing options can also be a way of accelerating the adoption of cage/crate-free systems.



Raising consciousness about animals (and people!) welfare continues to be necessary, even after decades of discussion about this subject. For social actors involved with animal production, there is a general feeling that not only animal welfare is improved but also the wellbeing of people working directly in alternative systems, in comparison to conventional housing methods. Consumers can also be added to this reasoning, if we consider that the consumption of products that are more aligned to their personal concerns may increase their individual satisfaction. However, a large part of the general public is still unaware of hens and sows living conditions, and many studies show that educating them and expanding information about it can sensitize them and stimulate behavior changes.

Reduced **economic margins** and a lower **zotechnical performance** may be expected in the initial phase after changing from conventional to free-cage/crate systems. It is because immediate zotechnical indicators may decrease, while costs are higher due to the investments made. Producers and other social actors involved in this transition must recognize that. Most importantly, they should know that mitigation measures exist and can be adopted. Different methods and techniques were already developed, and they can help in the adaptation of animals and people to free housing conditions. Productivity and revenues can return to normal levels later. To be aware of this is very important as it may prevent farmers from abandoning alternative systems before the adjustment phase is completed.





FÓRUM
NACIONAL DE
PROTEÇÃO E
DEFESA ANIMAL

TINY
BEAM
FUND

