



2021 Annual Report

Research and Development
Technology Transfer
Administration

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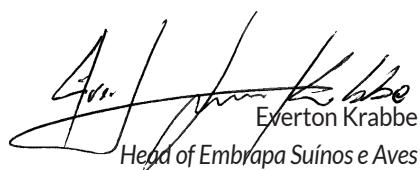
Research turned to increase the income and food safety of Brazilian population

Presentation

2021 was a period when many changes occurred at Embrapa Suínos e Aves, both in its administrative and research processes. However, we kept the focus on developing innovative solutions for the Brazilian society and reached many relevant results. Many others are yet to come, as they have been sown in the last year.

The objective of this Annual Report is to summarize paramount actions Embrapa Suínos e Aves developed last year.

We invite you to know in the following pages pivotal contributions Embrapa Suínos e Aves delivered to society in 2021. All of them relate to efforts undertaken by Embrapa Suínos e Aves's employees and partners.



Everton Krabbe
Head of Embrapa Suínos e Aves

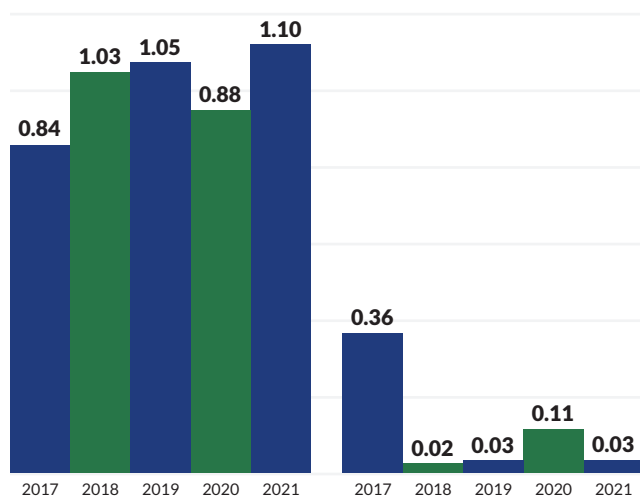
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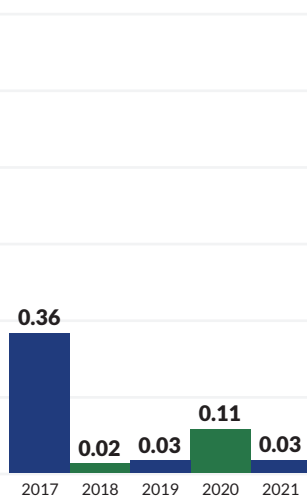
Costing, investment and staff evolution at Embrapa Suínos e Aves 2017-2021



Total costing
*In US\$ million

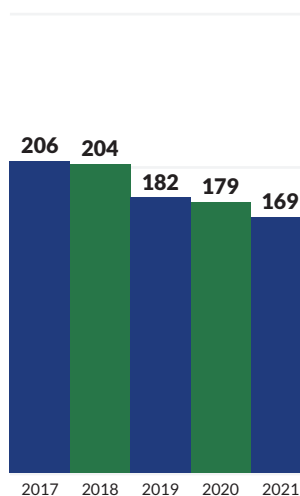


Investment
*In US\$ million



Employees

*As of December 31 of each base year



41
researchers
47
analysts
28
technicians
53
assistants

Embrapa Suínos e Aves' Indirect Revenue from 2017-2021

*From 2020 onwards, are considered the amounts fulfilled (spent) and not those collected in the year

	2017	2018	2019	2020	2021
Revenue	US\$	US\$	US\$	US\$	US\$
Events revenue/Technology Transfer	36,836.50	32,083.50	50,890.29	31,300.97	16,854.00
Research Support Foundations	585,872.43	640,983.50	547,449.90	302,404.85	878,523.32
Coperdia Pig and Poultry Contract Farming	244,664.85	322,941.17	353,382.91	446,739.61	641,063.55
Other partnerships (BRF, CNPq, Fapesc, Aincadesc)	675,756.89	576,798.25	1,293,906.41	275,241.75	6,368.93
Total	1,543,130.68	1,572,806.41	2,245,629.51	1,055,687.18	1,542,809.81



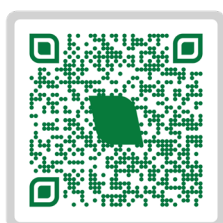
Investments

US\$ 32.8 thousand applied in different improvements in 2021

Description	US\$
INFRASTRUCTURE	
Fire-fighting prevention project, compliance with accessibility standards and others	31,057.11
Subtotal (1)	31,057.11
EQUIPMENT	
Manual and electronic debeakers (3)	1,797.07
Subtotal (2)	1,797.07
TOTAL 2021	32,854.18

Embrapa Genetics

Market share from 2017-2021



LEARN MORE ABOUT
THE 051 LAYING
HEN AND THE
MS115 SWINE

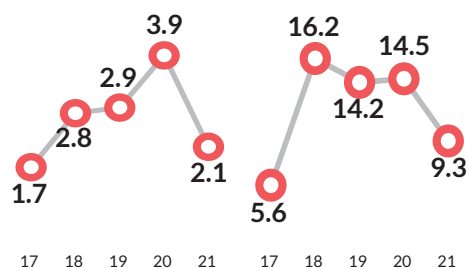


Laying Hen 051

*National market of brown-egg laying hens

Sold birds
*In million

Share
*In %

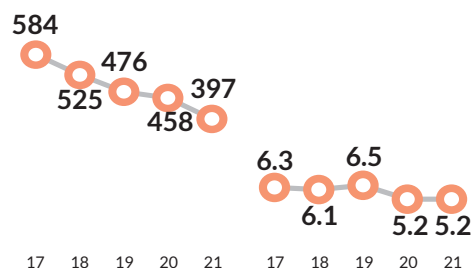


MS115 Boar

*National market of terminal males

Sold boars
*Units

Share
*In %



New administration, new challenges



New head's inauguration ceremony held in November



Everton Krabbe

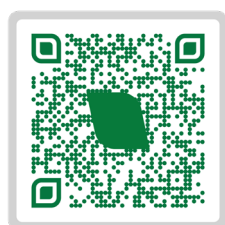
Head of Unit

The researcher Everton Krabbe took office at Embrapa Suínos e Aves in September 2021. He underlined three guidelines that will drive Embrapa Suínos e Aves's operation in the following years.

The first point is to align research and development with production value chains' demands. Second, to manage the Unit focused on efficiency and cost reduction. And third, to turn technology transfer initiatives into the development of pig and poultry production systems.

The new administration also intends to concentrate efforts to affect the knowledge forefront and anticipate trends that will bias the development of the full potential of the Brazilian pig and poultry sectors.

Stronger partnerships and focus on innovation



KNOW MORE
ABOUT THE NEW
ADMINISTRATION



Rodrigo Nicoloso

Deputy Head of Research and Development

Among the challenges proposed by the new administration in research and development is a sharper alignment of the Embrapa Suínos e Aves's project portfolio with demands from the productive sector. It is also a crucial aim to integrate Embrapa Suínos e Aves's experimental fields into the private sector. Another objective is to promote research related to predictive modeling and agriculture 4.0.



Franco Martins

Deputy Head of Technology Transfer

Accelerating partnerships and projects articulated with private institutions and companies are targets assumed by the new administration to generate fundraising and encourage research with the productive sector. This sort of commitment facilitates the flow of technologies from research institutions to society.



Darci Dambrós Junior

Deputy Head of Administration

The new administration established an action plan in which the mobilization of external funding resources is pivotal. They expect to contribute to strengthen Brazilian pig and poultry value chains by articulating public-private investments in research.

Administration of results and innovation

From 2014 to 2021, the researcher Janice Zanella headed Embrapa Suínos e Aves, and her administration achieved paramount deliveries.

In research and development, it responded to Embrapa's management changes, structured the thematic research groups and received institutional awards.

The administration headed by Janice Zanella impacted actions linked to public policies. Some examples of this

contribution are the federal slaughter inspection system modernization, disposal of dead animals, wild boar system control, pig farming environmental licensing, animal welfare regulations, and winter cereals nutritional and economic evaluations.

Products and technologies generated by Embrapa Suínos e Aves from 2014 to 2021 reached producers and technicians through joint actions focused on technology transfer and communication.



Former deputy heads Cassio Wilbert (Technology Transfer), Airton Kunz (Research and Development), and Armando Lopes do Amaral (Administration) with former head Janice Zanella

Staff accomplishes 70 projects and reaches 54 results

The Embrapa Suínos e Aves's staff accomplished 70 research in 2021 projects, of which 33 unfolded under its leadership. The other 37 projects occurred in partnership with other units of Embrapa and research institutions, in which Embrapa Suínos e Aves participated in action plans or specific activities.

During the year, 11 projects led by Embrapa Suínos e Aves were finished and 11 new ones were approved in funding sources from Embrapa or partners (private and public).

Embrapa Suínos e Aves made 54 deliveries in different areas in 2021. Two pivotal contributions were biological collections (16) and technical-scientific methodologies (11) deliveries. The other deliveries focused on supporting the formulation and execution of public policies (5), databases (5), socioeconomic or impact assessment studies (5), agricultural or industrial products/inputs (4), institutional arrangements (2), biotechnology-based assets (1), training and technological updating of multiplying agents (1), internal training in strategic areas (1), prospective studies (1), agricultural processes (1) and industrial processes (1).



LEARN ABOUT
KNOWLEDGE
RESULTS REACHED
IN 2021

45 articles published in A-level scientific journals

79 scientific articles published in indexed journals

16 articles published in specialized magazines and 9 in conference proceedings

5 books edited or organized

17 technical-scientific book chapters published

8 Documents Series published

2 brochures, leaflets, or booklets published

9 technical report edited



Technical-scientific production acknowledged as a reference

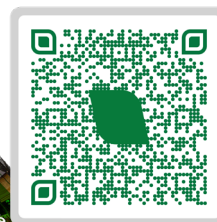
The main topics worked by Embrapa Suínos e Aves can be followed by the Brazilian society and the international community via its website on the Internet. It is the interface where information on projects, publications, and videos are made available.

New publications



➔ SIF Pigs

The document "Sanitary inspection modernization in pig slaughterhouses: risk-based inspection" was translated into English by the Ministry of Agriculture to meet the requirements of international missions.



➔ Good Practices Guide

The "Good Practices for the Welfare of Cage-Free Laying Hens Guide" was produced by Embrapa Suínos e Aves in partnership with the Ministry of Agriculture and NUPEA/Esalq.



CHECK ALL
EMBRAPA SUÍNOS E
AVES PUBLICATIONS



Contributions through animal health, environment, genetics, and animal management

Research highlights

Embrapa Suínos e Aves improved research aimed at medium and long-term impacts. This action underpins several initiatives, such as public policies support, production improvement, knowledge development, and international collaboration.



SIF Poultry

Embrapa and the Ministry of Agriculture worked together to update the slaughtering chickens' protocol, increasing the safety of the process. New procedures range from microbiological assessments to activities supervised by a veterinarian.



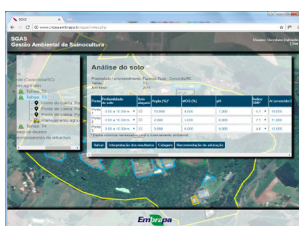
CMISEA

Embrapa Suínos e Aves maintained a collection of 2,600 bacteria and viruses that cause diseases in poultry and pigs. It is the Microorganisms of Interest for Pig and Poultry Farming Collection (CMISEA).



Winter cereals

Results demonstrated that wheat and triticale are the cereals with the greatest potential to replace corn in pig and poultry diets. Studies also evaluate barley and rice.



SGAS and IN11/SC

The Pig Farming Environmental Management Software was one of the components of the Operating Environmental License Renewal and Self-Declaratory Environmental Authorization for pig farming (IN 11/SC).



International

Embrapa took part in the Codex Alimentarius Antimicrobial Resistance Task Force (FTAMR) and the One Health High-Level Expert Panel (OHHLEP).

Public policies contributions are one of the major technical staff efforts

Aligned demands

Research actions focused on value chains priorities

Action Strategy

Embrapa Suínos e Aves' strategic actions along the pig and poultry value chains take place on a constant basis by contributing to the sustainability of both segments. Embrapa plays its role through five research thematic groups, which carry out projects on subjects such as animal health, production and nutrition systems, food safety, genetic and genomic improvement, environment, and socio-economy.

Thematic Groups

The research thematic groups are focused on pig and poultry value chain development. They also develop a work aligned with private and public sectors demands. See on this page thematic groups' main actions in 2021.



NTPA

Poultry Production Thematic Group

- » Prospection of microRNAs associated with broilers white striping pectoral myopathy
- » Nicarbazin residues in chicken tissue conditioned to litter reuse
- » Corn in vitro digestibility for broilers
- » Variability mapping of winter cereals nutritional value

NTSA

Poultry Health Thematic Group

- » Diseases caused by viruses, bacteria, and parasites
- » Virus sequence analysis
- » Viral vaccines development
- » Use of nano drugs with coccidiostatic action
- » Biological biosafety and GMO containment areas
- » Support for poultry health protection

Embrapa Genetics: leading-edge research results



*Embrapa 051,
a brown egg shell laying hen*

NTPS

Pig Production
Thematic Group

- » Land-saving technologies linked to pig and poultry production
- » Pig transport good practices, animal welfare data network, water management
- » Ambience related to pig production facilities
- » Raw materials nutritional assessment for pig feeding
- » Pig genomics

NTSS

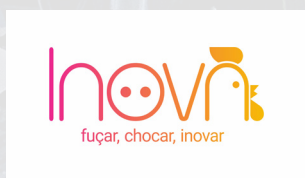
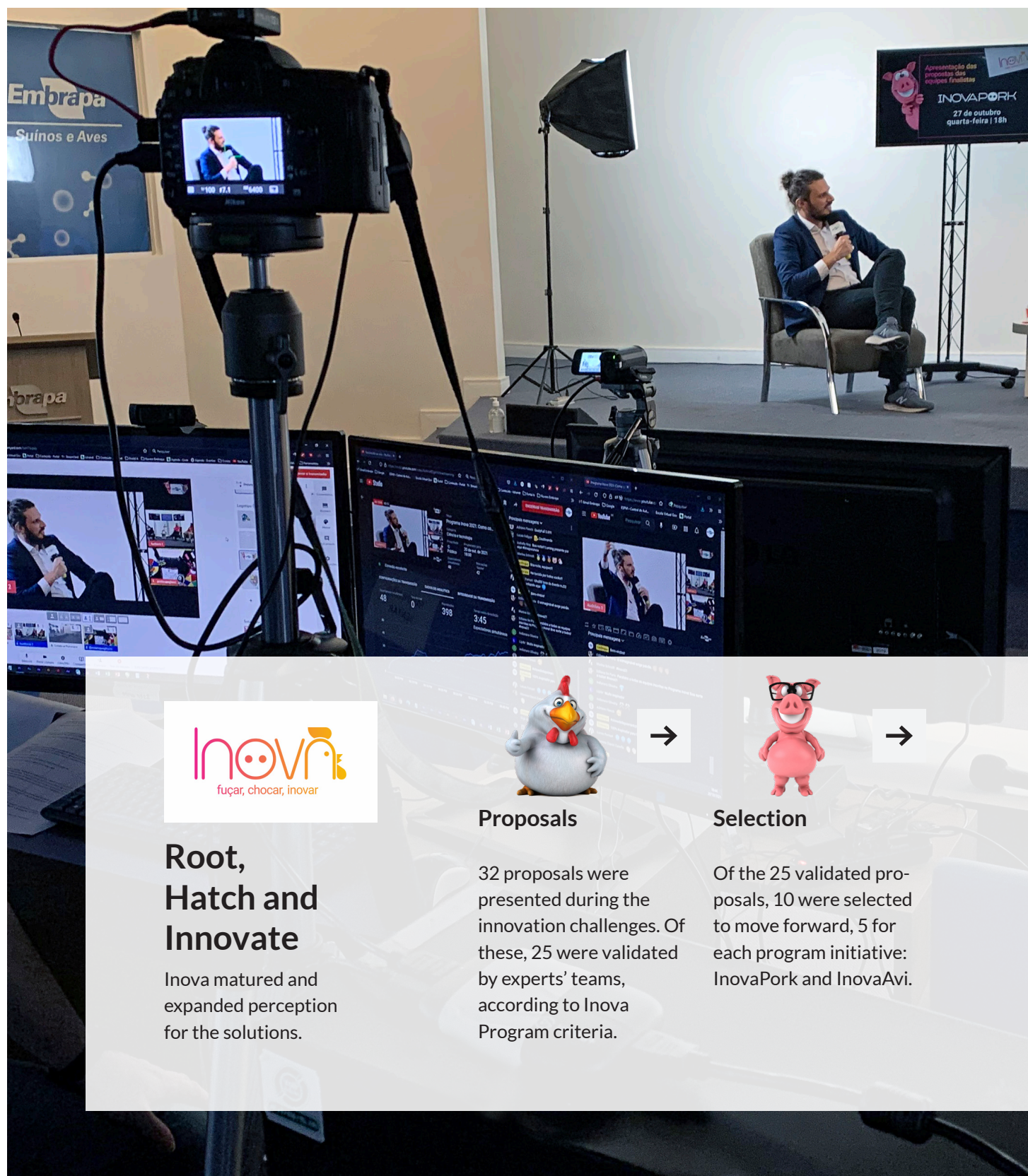
Pig Health
Thematic Group

- » Food safety (inspection modernization, antimicrobial resistance)
- » New techniques for diagnosis, control, and prevention of animal diseases with economic and human health impact (Influenza, Senecavirus, Hepatitis E)
- » Wild pig population epidemiological surveillance
- » Microbiological collection

NTMA

Environment
Thematic Group

- » Water management and reuse and production waste disposal
- » Biogas from pig manure
- » Animal production bio-inputs
- » Algatech
- » PronaSolos
- » Environmental management model for areas with intensive animal production in the Brazilian Southern



Root, Hatch and Innovate

Inova matured and expanded perception for the solutions.



Proposals

32 proposals were presented during the innovation challenges. Of these, 25 were validated by experts' teams, according to Inova Program criteria.



Selection

Of the 25 validated proposals, 10 were selected to move forward, 5 for each program initiative: InovaPork and InovaAvi.



Broadcast of one of the nights of the event, live from the Embrapa Suínos e Aves auditorium in Concórdia



Inova Program reveals impact solutions for pig and poultry

Innovation, outlook, trends... This is what took place in the Inova Program: Root, Hetch and Innovate, which brought together the innovation initiatives InovaPork and InovaAvi in 2021. At the end of the event, the three winning proposals for each initiative were announced. The 2021 edition advanced in developing a successful model to create opportunities for connections and help pig and poultry sectors to meet solutions to their demands.



The innovation trail

The teams experienced an immersion in the innovation world, passing through the four axes. They were also tutored by Unochapecó, INCTECH, and Embrapa to improve their proposals.



Mentorships

Throughout the innovation trail process, the teams got mentors' counseling, who helped to sharpen ideas presented by Inova Program contestants.



Partnerships

The expectation is to continue working with these startup teams, reinforcing Embrapa's image as a crucial agri-food innovations catalyst.



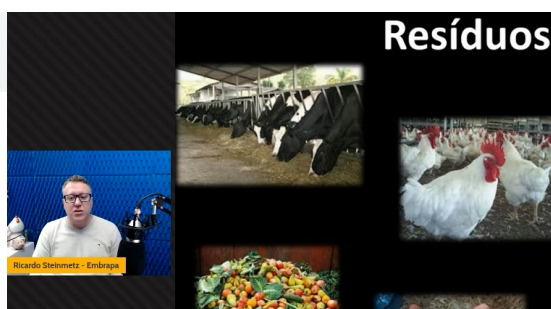
VISIT THE
INOVA PROGRAM
WEBSITE

Dynamic communication aimed at Embrapa's audiences



8 external online events

- » Technical and institutional participation
- » Show Rural Coopavel, Agrotins, Expointer, Sigera, Southern Brazilian Forum on Biogas and Biomethane, Southern Brazilian symposiums on Pig Production and Poultry Production, and Tec Agro



3,065 mentions in the media

- » 224 journalist contacts
- » 49 texts sent to the media
- » 2 Prosa Rural (Embrapa's radio program)
- » 13,000 followers on Facebook, 3,000 on LinkedIn, and 1,300 thousand on Instagram



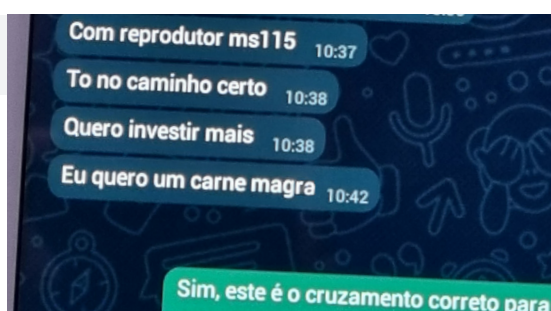
64 hours of live broadcasting

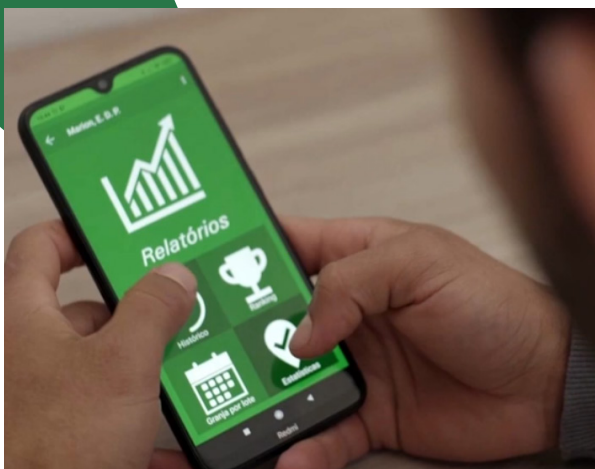
- » 40 live broadcastings of courses, events, and products launching on Embrapa's and partners' channels
- » 229 videos produced (advertisements, reports, and interviews)



1,424 attendances

- » 875 via the official customer service (SAC via Embrapa website)
- » 276 by WhatsApp
- » 174 by phone
- » 99 by email





Custo Fácil, android app



"You are what moves us" series

- » 9 episodes streamed live on YouTube
- » +12 thousand views on the Embrapa channel
- » Poultry, environmental management, and pig farming



Pint of Science

- » 2 events streamed live on YouTube
- » +2,000 views on the Embrapa channel
- » Science in accessible language



Awards received

- » 22nd Fritz Müller Award (SGAS)
- » Fundação Banco do Brasil Social Technology Award (Custo Fácil)
- » Santa Catarina Innovation Award "Professor Caspar Erich Stemmer" (Innovative Science and Technology Institution)



e-Campo online education

- » 4 courses made available
- » 10,973 students enrolled
- » 1 course in development for 2022



Qualifications offered

- » 92 events and 254 participations
- » 5.6 thousand hours of training
- » US\$ 7,300 invested



Science Field Day

- » Streamed live on YouTube
- » Five stations of knowledge
- » Students from all over the country

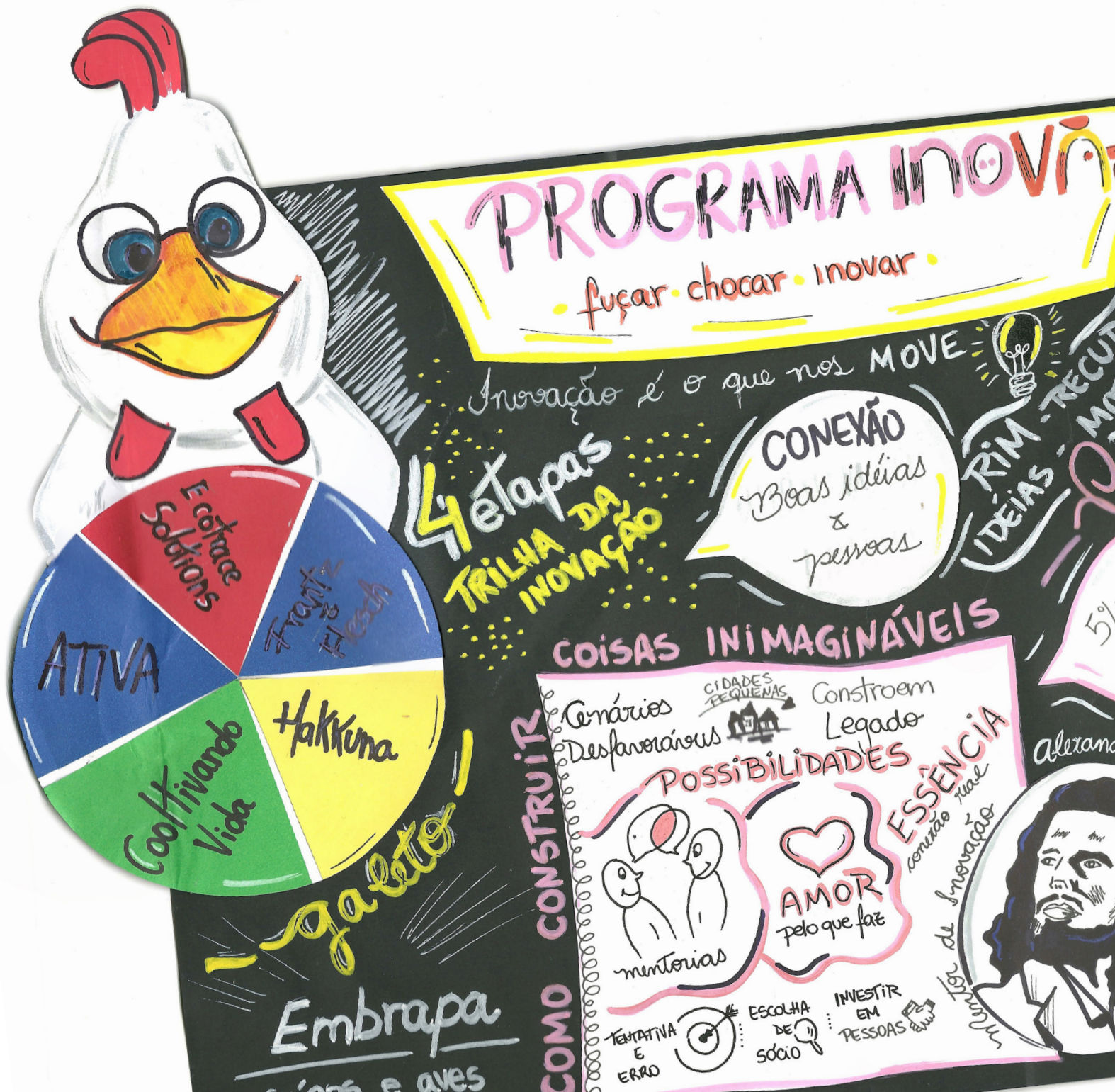


Scientific Initiation Journey (JINC)

- » 78 works submitted and 70 approved
- » 50 poster presentations
- » 20 oral presentations



Course on the e-Campo platform



Innovation
MOVE US



Production Performance 2021



14.5 million
tons of meat

#3rd in production | ▲4.5% (2020»2021)
#1st in exports | ▲9.0% (2020»2021)



4.3 million
tons of meat

#3rd in production | ▲4.8% (2020»2021)
#4th in exports | ▲12.2% (2020»2021)



54.5 billion
units

production | ▲1.8% (2020»2021)
exports | ▲81.5% (2020»2021)



157 thousand
tons of meat

production | ▼1.7% (2020-2021)
exports | ▲13.1% (2020-2021)

*Sources: ABPA, USDA



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