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Food supply chain losses and waste: What are the challenges for the Brazilian soybean industry?

Mores, Giana de Vargas¹

Giehl, Raquel Bernardon Toigo^{1,3}

Kawano, Bruno Rógora²

Dewes, Homero¹



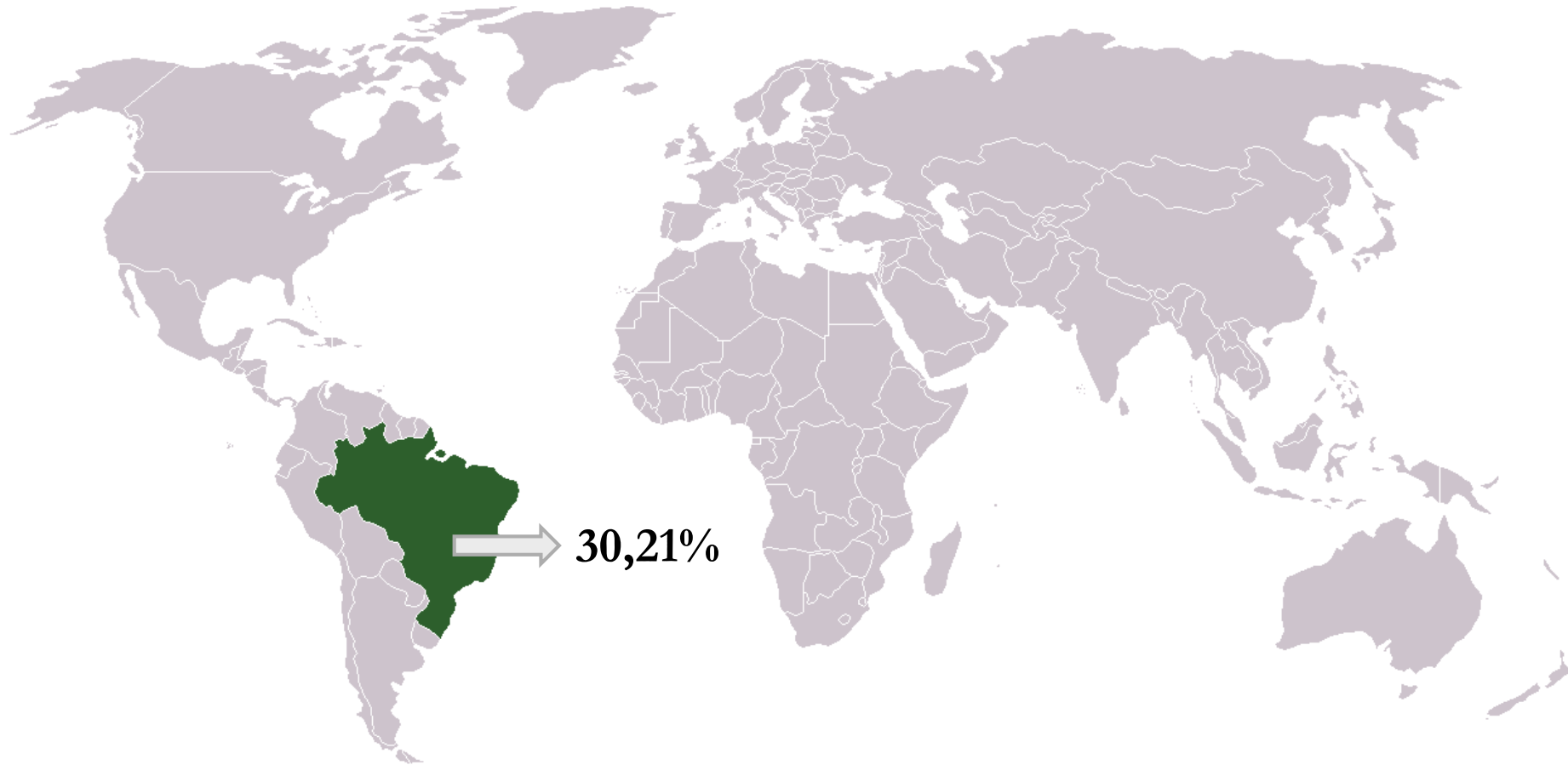
¹Federal University of Rio Grande do Sul,
Center for Studies and Research in Agribusiness

²University of São Paulo, Polytechnic School

³Presenting author



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- The world soybean production (estimated - 2014): 311200.0 1000 metric tons;
- For Brazil, 94000.0 1000 metric tons (MAPA, 2014);



Introduction

Objective

- The aim of this paper is to quantify and identify the sources of the food losses and waste of the Brazilian soybean industry, headed for human food, considering the stages of food supply chain, in the period 2002-2011.



Procedures

- Data were collected by the FAOSTAT;
- The methodology of Gustavsson et al. (2011);

Table 1. Losses and waste percentage from oilseeds and pulses in each stage of the FSC, in Latin America

Losses and waste percentage in each step of the FSC	Value
Agricultural production = 6%	0.06
Postharvest handling and storage = 3%	0.03
Processing and packaging = 8%	0.08
Distribution = 2%	0.02
Consumption = 2%	0.02

Source: Elaborated by authors based on Gustavsson et al. (2011).



Results

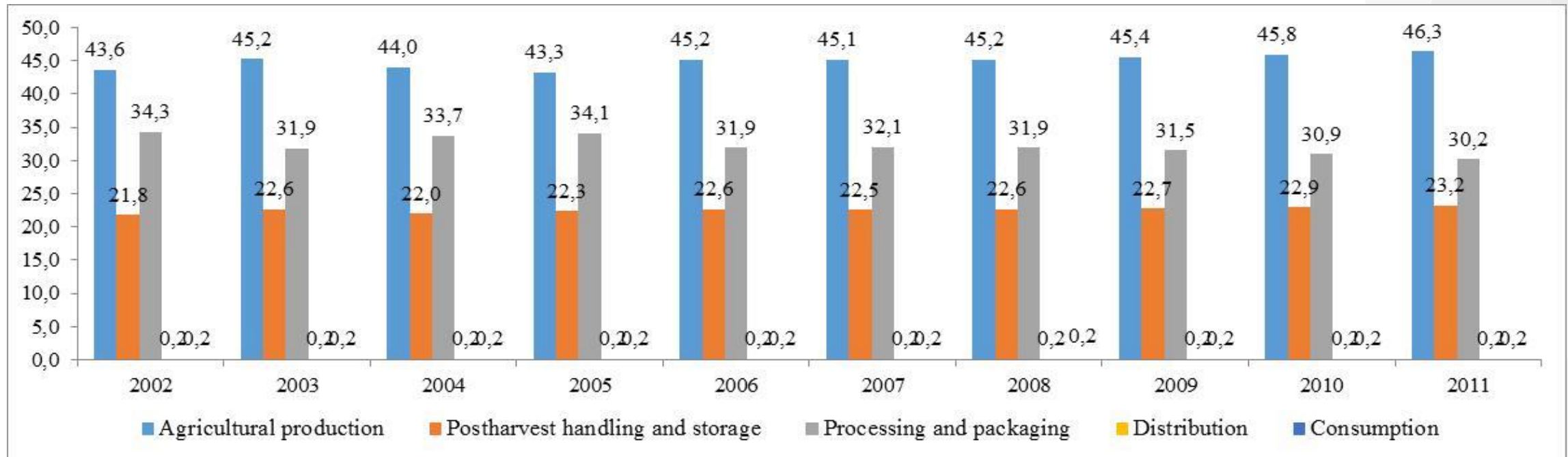
Table 2. Losses and waste calculations on primary equivalent from Brazilian soybean industry in each stage of the FSC (2002-2011)

Stage	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	%
Agric. product.	2566.1	3115.1	2973.0	2973.0	3147.9	3471.4	3590.0	3440.7	4125.4	4488.9	74.9
Postharvest	1283.1	1557.6	1486.5	1535.5	1574.0	1735.7	1795.0	1720.4	2062.7	2244.5	74.9
Processing	2019.6	2195.0	2275.9	2341.5	2221.2	2468.3	2534.3	2385.4	2783.6	2922.0	44.7
Distribution	10.3	11.2	11.6	11.9	11.3	12.5	12.9	12.2	14.2	14.9	44.7
Consumption	10.3	11.2	11.6	11.9	11.3	12.5	12.9	12.2	14.2	14.9	44.7
Total	5889.4	6890.1	6758.6	6873.8	6965.6	7700.4	7945.1	7570.7	9000.0	9685.2	64.5

Source: Calculated by authors. Note: values in 1000 metric tons.

Results

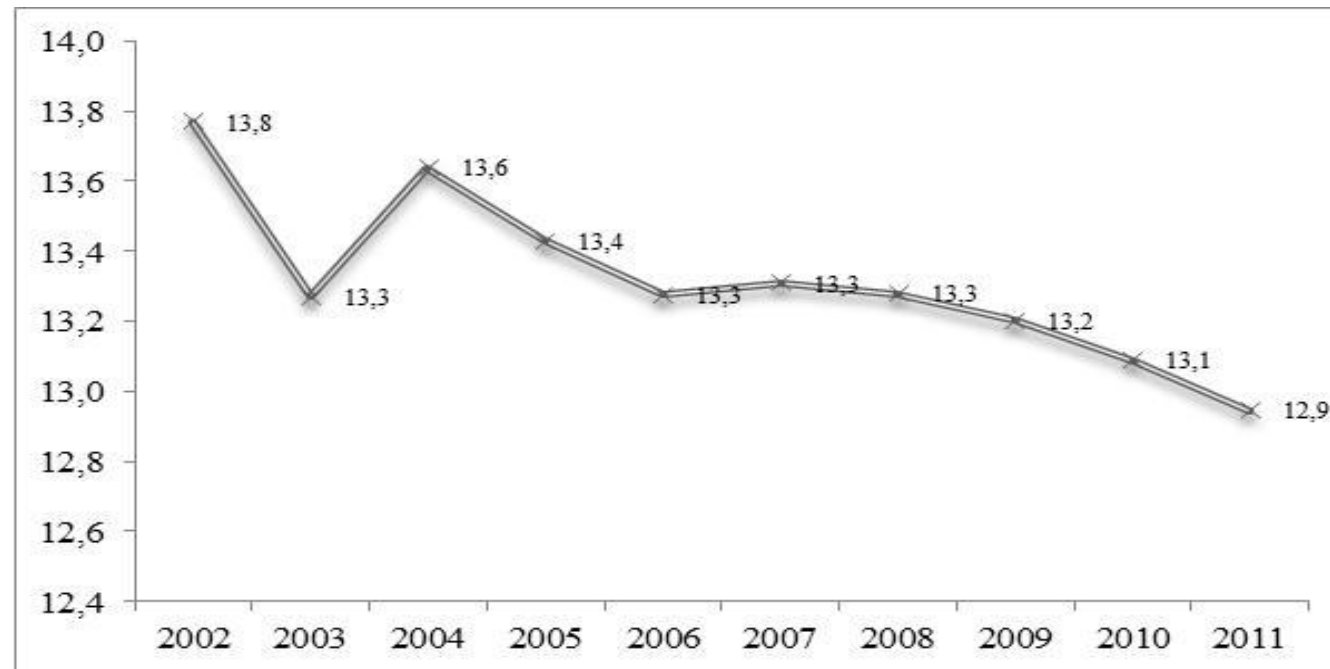
Figure 1. Losses and waste percentage from Brazilian soybean industry in each stage of the FSC (2002-2011)



Source: Elaborated by authors.

Results

Figure 2. Losses and waste percentage in Brazilian soybean industry production (2002-2011)



Source: Elaborated by authors.

Results

Figure 3. Losses factors and alternatives for their reduction in each stage of the soybean supply chain

Stages	Factors causing losses	Possible alternatives to reduce losses
Agricultural losses	Diseases and pests on crops; unfavorable climatic conditions for cultivation; mechanical damage to the crop.	Greater investment in breeding programs to obtain varieties adapted to drought and diseases and more resistant to mechanical damage. Proper management of mechanical harvesting.
Postharvest losses	Inadequate preparation of soybean in trucks carrying the load, causing spillage along the way of making up storage; poor storage conditions; improper handling.	Using appropriate trucks and in good conditions to transport soybean; major investments to improve roads, so there is less load vibrations and, therefore, less spills in transport; appropriate storage conditions; proper handling of soybean in the loading stages in trucks and storage bin.
Processing losses	Industrial processing of soybean in conditions outside the international standards.	Adequacy of soybean manufacturing processes as raw material; greater investments in machinery; more modern and efficient equipment to reduce losses in processing.

Source: Elaborated by authors.



Conclusions

- The main stages of the FSC in which there are losses;
- Alternatives which result in the losses reduction in each of the stages in the FSC;
- The efficiency of Brazilian soybean industry.



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Thanks for your attention!

Giehl, Raquel Bernardon Toigo
raqueltoigo@hotmail.com

Federal University of Rio Grande do Sul,
Center for Studies and Research in Agribusiness
<https://www.ufrgs.br/cepan>
+55-51-3308-6586

