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# **ARTICLE**

# Agribusiness is male-dominated: professional discrimination of women in the sector

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# Abstract

Several studies show the existence of gender inequality in the labor market. The evidence of these asymmetries motivated this study, which aimed to identify how the process of professional insertion of graduates of Agricultural Sciences and Agribusiness Technology from public educational institutions in Goiás has been taking place and whether there are gender-related inequalities in this process. A survey was carried out, obtaining 593 questionnaires answered by graduates of these courses between August 2021 and January 2022. Data was analyzed using descriptive statistics and logistic regression. The main results indicate the following gender inequalities in the professional insertion of graduates: women are more likely to be unemployed; they have greater difficulty in obtaining work in the area of training; they have not been able to ascend professionally to the same extent as men; and they receive lower salaries, even when performing the same functions. The research findings point to gender inequality in agribusiness work and highlight the precarious professional insertion of women in this sector.

**Keywords:** Gender. Inequality. Professional insertion. Agribusiness. Sexual division of labor.

# O agro é masculino: discriminação profissional de mulheres no agronegócio

# Resumo

Vários estudos demonstram a existência de desigualdade de gênero no mercado de trabalho. A constatação dessas assimetrias motivou o presente estudo a identificar de que forma vem ocorrendo o processo de inserção profissional de egressos de Ciências Agrárias e Tecnologia em Agronegócio formados em instituições de ensino públicas de Goiás e se, nesse processo, há desigualdades relacionadas a gênero. Para alcançar o objetivo, foi realizado um levantamento que resultou em 593 questionários respondidos por egressos(as) dos cursos mencionados, no período de agosto de 2021 a janeiro de 2022. Os dados obtidos foram analisados por meio de estatística descritiva e regressão logística. Os principais resultados indicam as seguintes desigualdades de gênero na inserção profissional dos egressos: mulheres são maioria entre os desempregados; enfrentam maior dificuldade para encontrar trabalho na área de formação; a ascensão profissional feminina não tem ocorrido na mesma proporção comparativamente à masculina; mulheres recebem salários inferiores, ainda que exerçam as mesmas funções. As conclusões da pesquisa apontam a existência de desigualdade de gênero no contexto do trabalho no agronegócio e evidenciam a precária inserção profissional das mulheres neste setor.

Palavras-chave: Gênero. Desigualdade. Inserção profissional. Agronegócio. Divisão sexual do trabalho.

# La agroindustria es masculina: discriminación profesional de las mujeres en el sector

## Resumen

Diversos estudios demuestran la existencia de desigualdades de género en el mercado de trabajo. La constatación de estas asimetrías motivó el presente estudio, que tuvo como objetivo identificar cómo viene ocurriendo el proceso de inserción profesional de los graduados en Ciencias Agrarias y Tecnología de Agronegocios de las instituciones públicas de enseñanza de Goiás y si existen desigualdades relacionadas al género en este proceso. Para alcanzar dicho objetivo, se realizó una encuesta que proporcionó 593 cuestionarios respondidos por graduados de estos cursos, entre agosto de 2021 y enero de 2022. Los datos obtenidos se analizaron mediante estadística descriptiva y regresión logística. Los principales resultados indican las siguientes desigualdades de género en la inserción profesional de los egresados: las mujeres son más propensas a estar desempleadas; tienen mayores dificultades para conseguir trabajo en el área de formación; no han logrado ascender profesionalmente en la misma medida que los hombres; y perciben salarios más bajos, aun desempeñando las mismas funciones. Las conclusiones de la investigación apuntan a la existencia de desigualdad de género en el trabajo agroindustrial y destacan la precaria inserción profesional de las mujeres en este sector.

Palabras clave: Género. Desigualdad. Inserción profesional. Agronegocio. División sexual del trabajo.

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#### INTRODUCTION

The transition between the university and the labor market is not equitable for the different individuals who manage to obtain a professional degree (Martins et al., 2019). Gender plays an important role in the dynamics involving individuals in the workplace, often favoring men over women (Hirata & Kergoat, 2007). The labor market reinforces gender differences and reproduces inequalities through the sexual division of labor, which consists of a division of social labor resulting from social relations between the genders (Hirata & Kergoat, 2007).

Gender inequality in the labor market is portrayed in various sectors by several researchers. Authors such as Haussmann et al. (2018), Moraes et al. (2022), and Vogt et al. (2020) focused on studies in the area of Applied Social Sciences. Borges et al. (2021) and Fernandez (2019) focused their research on the agribusiness sector. Salvagni (2020) undertook a specific study of female truck drivers. Marília and Almeida (2015) addressed the issue of academic careers, while Coutinho et al. (2021) and Hryniewicz and Vianna (2018) investigated the difficulties faced in gaining management positions. Despite the inequalities between men and women in participation in the labor market, new work and cultural arrangements have made it possible for women to enter professions considered masculine, such as military police, app drivers and financial market operators (Colodetti & Melo, 2021; Sá et al., 2022; Spinelli-de-Sá et al., 2017). However, there are still stereotypes that demarcate certain professions and activities as typically masculine, a legacy of a patriarchal society (T. T. R. W. Proni & M. W. Proni, 2018).

Among the sectors occupied mostly by men, agribusiness is noteworthy. There are a few studies on the work of women in this sector (Borges et al., 2021; Menezes & Silva, 2016; Oliveira & Serra, 2018; Pereira et al., 2011; Silva & Redin, 2020; Szöllösi & Dias, 2017), however, they do not delve into the debate on gender inequality. One of the few studies to address this issue is Szöllösi and Dias (2017), who looked at the career paths of female agronomists and identified gender inequality. Barros et al. (2019) also point to inequality in the sector. Nevertheless, as these studies are not based on gender studies, their findings have some limitations.

Still with regard to gender inequalities, unemployment particularly affects women (Bruschini, 2007; Cabral & Veronese, 2020). In Brazil, there are currently more unemployed women than men (Instituto Brasileiro de Geografia e Estatística [IBGE], 2022).

Thus, research converges on the unfavorable conditions experienced by women in the job market. Despite the intense discussions on the subject in recent decades, this is still a problem to be overcome.

Regarding education, there has been a significant increase in the number of graduates from higher education of both genders. However, in the area of Agricultural Sciences and Agribusiness, little is known about the entry of its recent graduates into the job market and how gender inequalities have affected them (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira [INEP], 2016), due to the lack of research dealing specifically with the subject.

Therefore, this article aimed to identify how graduates in Agricultural Sciences and Agribusiness Technology from public education institutions in Goiás are finding their way into work, and whether there are any gender-related inequalities in this process. As specific objectives, we sought to: 1) identify the main types of professional insertion of graduates and the differences in the participation of men and women in the sector; 2) assess whether gender is a factor that influences unemployment and professional inactivity; 3) investigate whether there are differences between the professional activities carried out and positions held by gender; 4) check whether there is a disparity in income due to gender and/or level of education. In order to achieve these objectives, a survey was carried out with graduates of these courses and, in order to discuss the findings, we used materialist feminist literature – which addresses gender inequalities with an emphasis on the sexual division of labor – and intersectional studies, which discuss the intersections between race, class and gender.

# LABOR AND GENDER INEQUALITY

The sexual division of labor – the focal point of Saffioti's (1969) work on the position of women in Brazilian society – has been the subject of intense debate in Brazil (Biroli, 2018) and around the world (Kergoat, 2009). This topic refers to the division of social labor linked to social relations between the sexes, which assigns priority to men in the productive sphere and women in the reproductive sphere. This form of social division of labor is based on two organizing principles: the principle of separation – the idea that there are men's and women's jobs – and the hierarchical principle – the understanding that men's work is "worth" more than women's work (Hirata & Kergoat, 2007). The consequences of the naturalization of this division are the multiple barriers women face in their daily lives, seen both in the restricted access to certain occupations and professional positions and in the accumulation of professional activities and domestic care (Biroli, 2018).

Gender inequalities in the labor market are manifested through three central mechanisms: 1) pure wage discrimination, since men usually receive higher salaries than women, even in identical occupations; 2) occupational segregation: women, in general, occupy less qualified jobs with lower pay; 3) difficulty in women's professional advancement, a phenomenon commonly referred to as the "glass ceiling", which refers to a subtle barrier to women's and minorities' ascension to higher hierarchical levels (Acker, 2006; Figueredo & Cavazotte, 2022; Haussmann et al., 2018; Hirata, 2018; Maia, 2016; T. T. R. W. Proni & M. W. Proni, 2018; Thome & Melo, 2018; Vaz, 2013).

In terms of earnings, the gender pay gap persists: in 2019, the amount received by women, on average, represented 77% of the amount earned by men. Among management positions, inequalities reach even greater proportions (IBGE, 2021; Instituto Econômico de Pesquisa Aplicada [IPEA], 2019) and, even in equal roles, men's salaries are higher (T. T. R. W. Proni & M. W. Proni, 2018).

Occupational segregation occurs horizontally through occupational and sectoral segregation in employment, restricting activities to specific sectors. Vertical segregation is linked to difficulties in ascending to higher hierarchical levels (Biasoli, 2016; Hirata & Kergoat, 2007; Thome & Melo, 2018).

Professions and jobs can be segregated by both gender and race. What appears to be a reduction in segregation may only be its reconfiguration. Reconfiguration and differentiation occur as women enter occupations previously dominated by men. When a woman becomes a doctor, for example, she is more likely to specialize in pediatrics than surgery, an area dominated by men. When a woman achieves a place in the same profession, the way she goes about it, the activities and practices are still segregated (Acker, 2006).

Gender inequalities also reflect in organizational structures, which, despite presenting themselves as gender neutral, are permeated, by socially conceived gender constructions and hierarchies, which are reflected in job arrangements, pay, processes and organizational hierarchies, marginalizing women and contributing to the reproduction of gender segregation in organizations (Acker, 1990, 2006).

Finally, it is also necessary to approach race, class, and gender transdisciplinary to understand the complexity of identities and social inequalities (Biroli, 2018; Hirata, 2014). "[...] sexism, racism and classism are forms of oppression which, although they have different histories, nevertheless act interdependently" (Hirata et al., 2009, p. 94). Kergoat (2010) attests that class, gender and race conflicts tend to be analyzed individually, but reinforces the interdependence of these categories. The complex intertwining of gender, race and class makes it necessary to incorporate these three axes to make more in-depth interpretations of the social world (Biroli & Miguel, 2015). In other words, gender and race interfere with assumptions about ability, responsibility and fair wages, producing wage differentials (Acker, 2006).

#### FEMALE PARTICIPATION IN AGRIBUSINESS

Few studies have linked agribusiness and gender. Among them, the study by Silva and Redin (2020) identifies that women find it difficult to enter the sector and, at the same time, experience strong male domination within the family, in undergraduate courses, in the workplace and even in their relationships. Similarly, Borges et al. (2021) investigated whether women working in agribusiness are the target of gender prejudice. The results revealed that just under half of the women interviewed claimed to suffer from gender prejudice and that this occurs regardless of position and level of education.

Pereira et al. (2011) compared female participation between two large agribusiness companies – Sadia and Perdigão – and identified its growth, but found no balance between the genders, especially regarding management positions. Oliveira and Serra (2018) investigated the participation, contribution, and inclusion of women in agricultural science in São Paulo. The results showed a low presence of women in senior management positions.

Szöllösi and Dias (2017) point to an increase in the number of women graduating in Agronomy, followed by a salary reduction. In this area, women still find it more difficult to get work and experience job dissatisfaction.

Menezes and Silva (2016) state that women in management positions in agribusiness seek to legitimize their work through training and specialization and that taking on a management position is often the result of some fatality, such as the death of a father or husband. The sexual division of labor prevails. In most cases, women rural producers take on the "office," while their husbands or fathers are responsible for production and marketing. Women are also assigned to domestic work and secondary activities such as looking after animals and vegetable gardens (Brumer, 2004). They lack opportunities in rural areas. How the division of labor occurs on farms assigns them the jobs that are considered less critical (Brumer, 2004).

The so-called generational succession (Gasson & Errington, 1993) traditionally prioritizes male heirs (Brumer et al., 2008). As a consequence of this inequality, women are less motivated to perpetuate productive activities on family farms (Botelho & Almeida, 2020; Matte et al., 2019).

# **METHODOLOGY**

We opted to carry out a survey to identify how the process of professional insertion of graduates in Agricultural Sciences and Agribusiness Technology from public educational institutions in Goiás has been taking place and whether there are inequalities related to gender. This is an appropriate research strategy for outlining a more comprehensive panorama of a given reality and/or social group.

The primary data for this research came from a questionnaire drawn up by the authors, based on the literature and validated by experts. The questionnaire was addressed to graduates of higher education courses in Agricultural Sciences (Zootechnics, Agronomy, Food Engineering and Technology, Agricultural Engineering, Veterinary Medicine, Forestry Engineering and Technology in Grain Production) and Technology in Agribusiness at the following institutions: Federal University of Goiás (UFG), State University of Goiás (UEG), Federal University of Jataí (UFJ) and Federal Institute of Goiás (IF Goiano). Between 2013 and 2020, these institutions collectively had 5,711 graduates from these courses, according to official reports provided by the institutions containing their details (name, telephone number, e-mail address). These were used to form a consolidated database, which enabled calculate the sample, identify the graduates, and collect the data.

Based on the population size, the research sample resulted in 361 questionnaires, following Cochran's guidelines (1977). However, 593 questionnaires were answered, which made the results even more representative.

Data collection took place between August 2021 and January 2022, using an electronic questionnaire sent via WhatsApp, LinkedIn, Facebook or email exclusively to graduates selected through probabilistic sampling. The results therefore represent the entire study population.

Binary logistic regression was used to analyze the data, using SPSS (statistical package social science) software. In addition, by analyzing the answers to the questionnaire, six typologies of professional integration were constructed, described in Box 1.

Box 1
Types of job placement

Types of job placement	Characteristics
<b>Type 1:</b> Professional experience in organizations related to the agro-industrial/agribusiness sector;	This refers to the group of graduates whose professional activity is closely related to their area of training and whose work is carried out in or for the organization of the agro-industrial/agribusiness sector, covering the input, farming/primary, agro-industry and/or agro-services segments. Example: agronomists who work specifically in this role on farms.
<b>Type 2:</b> Professional activity in the training area in organizations not related to the agro-industrial/agribusiness sector.	Graduates who work professionally in activities with a strong relationship with the training offered by their degree course, but who do not work in agro-industrial/agribusiness sector companies. Example: veterinarians who work as such in public bodies, laboratories and private companies unrelated to agribusiness.
Type 3: Generational succession.	Graduates who have now taken over rural properties that previously belonged to their families.
<b>Type 4:</b> Professional activity not related to the area of degree.	Graduates carry out professional activities that are unrelated to their higher education. Example: agribusiness technologist working as a hairdresser.
Type 5: Unemployed.	Graduates who are not doing any kind of professional activity but are trying to find work.
Type 6: Out of the workforce.	Graduates who are not working or looking for work. For example: mothers who devote themselves exclusively to looking after their children; graduates who are still only studying.

Source: Elaborated by the authors.

In order to understand the professional activities carried out by the graduates, they were asked about their current position and function. As the questions were open-ended, it was necessary to group similar positions, creating categories of professional activities, as follows:

Box 2
Professional activities

Professional activity	Description
Administrative and administrative management positions	Positions related to administrative activity, such as: financial assistant, administrative assistant and administrative management positions.
Positions directly related to area of degree	Positions specifically related to the title of higher education, such as: agronomist, zoo technician, veterinary doctor.
Positions indirectly related to area of degree	Positions related to the area of higher education completed. For example: livestock consultant; forestry business analyst; technical manager.
Positions not related to area of degree	Positions unrelated to higher education, such as: hairdresser; internet installer.
Positions in public bodies related to area of degree	Positions related to university degrees held in public institutions.
Positions related to the marketing of supplies/implements/commodities	Positions related to technical sales, commercial representation, technical sales consultant.
Entrepreneurial activity related to agribusiness	Business activities related to agribusiness, such as: consultancy; pet shop shopkeeper.
Entrepreneurial activity not related to area of degree	Business activities carried out in various branches: clothing stores; cosmetics; among others.
Entrepreneurial activity in rural production	Farming activities carried out on own property.
Technical management positions	Positions related to the management of technical production activities: production manager, quality manager, and other management activities related to the degree area.
Research and teaching	Positions related to teaching, research, and research assistance.
Rural activity on the family farm	Professional work in a rural property belonging to the family.

Source: Elaborated by the authors.

Experts in the field consulted and validated to verify the coherence of the classifications and groupings created. The questionnaire included questions about personal characteristics (gender, income, current schooling, salary, age and parents' schooling); professional status (active or inactive, sector of professional activity, position/activity held); questions about university education (course taken, institution, internship during university); being (or not) the child of a rural producer, as well as questions about succession and property characteristics, including topics such as income, area, investment in machinery in the last five years, whether or not they belong to family farming, among others.

# **OUTCOMES**

In order to present and discuss the results of the research, this section has been organized into four parts, namely: 1) Professional insertion of men and women in agribusiness; 2) Difference in pay and relationship with schooling; 3) Main activities performed by men and women; 4) Influence of gender on unemployment and professional inactivity.

# Professional integration of men and women in agribusiness

In the survey, the proportion of men and women graduating from the courses studied was 49% and 51% respectively.

The typologies created to categorize professional insertion make it possible to observe that, in type 1 (professional activity in the area of degree linked to agribusiness), the percentage of women working is only 40%. In contrast, outside agribusiness, there is a percentage of 12% of women working. In agribusiness degrees, a higher percentage of men get work (63%). Women predominate among those not working in the degree area (17%), among the unemployed (17%) and among those out of work (7%).

Table 1
Participation of the genders in the types of professional insertion

Categories	Women	Men
Professional activity in the area of degree linked to agribusiness	40%	63%
Professional activity in a degree area not linked to agribusiness	12%	6%
Family succession	7%	8%
Professional activity not related to the area of degree	17%	13%
Unemployed	17%	5%
Out of the workforce	7%	4%
Total	100%	100%

Source: Elaborated by the authors.

In this study, generational succession was considered a possible way for graduates to enter the profession. Other researchers rarely consider this alternative even though it is one of the common ways these professionals work. We found that 38% of the respondents are the children of farmers. There are 224 graduates in this group, with 59% men and 41% women. This led us to consider whether taking over the management of family farms was one of the paths chosen by the graduates.

The results show that women and men carried out generational succession in similar proportions: 7% and 8% respectively (Table 1). This is noteworthy because women have historically been passed over for generational succession. Of the properties where generational succession took place, 71% belong to family farming, with the rest being medium and large farms.

We measured aspects such as income from the property, level of education, area of the property, and whether or not they belonged to family farming, among others to understand the factors that influenced women to take on the succession, which did not show a statistically significant influence.

A logistic regression model was developed, using only the daughters of rural producers as the sample. The aim was to measure whether the variable "investments in machinery" – an important indicator of the modernization of the enterprise – has an influence on the dependent variable "generational succession". To do this, the variables were tested for collinearity and found not to exist. The proposed logistic regression model proved to be valid, given that:  $X^2$  (1) = 4.308, p (significance) < 0.05. The model's explanation of variance ranged from 0.086 (Cox & Snell) to 0.117 (Nagelkerke). Thus, the model's predictions are considered to be 12% correct, i.e. the model is able to explain 12% of the changes recorded in the "generational succession" variable.

The logistic regression, shown in Table 2, was generated by taking the dependent variable "Has generational succession taken place?" as a binary variable – coded 1-Yes, 0-No – and coding 1-Yes, 2-No for the independent variable "Has any type of investment been made in machinery in the last five years?". These results show that the independent variable – "investment in machinery" – has a causal relationship with the dependent variable – "generational succession".

Table 2
Binary logistic regression result

Variables in the equation							
B S.E. Wald df Sig. O					OR*		
1 <sup>st</sup> Stage	Investim_machinery(1)	1,386	0,682	4,133	1	0,042	4
	Constant	-0,916	0,374	5,997	1	0,014	0,4

\* OR - Odds Ratio

Source: Elaborated by the authors.

The odds ratio (OR) = 4 indicates that as the predictor "investment in machinery" increases, the chance of generational succession among farmers' daughters increases fourfold. Women are more likely to carry out generational succession on properties where investment is made in machinery. This may suggest that there are more opportunities for women on farms that are more open to modernizing production. Another possible interpretation is that women are more interested in working on modernized farms. Future research focused on understanding the phenomenon may better explain this finding.

The data also showed that parental encouragement seems to be a factor that positively affected succession. Among the former successors, 70% said they had received encouragement from their parents to take over the property.

Another point revealed by the survey is that, among the female successors, only 25% receive remuneration for their work on the family property. It suggests that generational succession by women may only be taking place in support roles for running the business, but not as the main activity of the heirs, as most of them carry out other professional activities to earn income alongside their activities on the family property.

# Pay gap and correlation with education

When we look at the average current income of the graduates, we see a significant difference in the income earned by men and women. The data shows that men have an average income of 6.9 minimum monthly wage, and women have a 3.2 minimum wage. Table 3 illustrates the differences in income. Most women have up to four minimum wages, while men's incomes are concentrated in the higher brackets.

Table 3
Current income in groups

Income bracket	Gender			
income bracket	Men	Women		
Income of up to 2 minimum wages	24%	47%		
Income from 2 to 4 minimum wages	24%	33%		
Income from 4 to 10 minimum wages	39%	20%		
Income from 10 to 20 minimum wages	10%	0%		
Income above 20 minimum wages	4%	0%		
Total	100%	100%		

Source: Elaborated by the authors.

Initially, the perspective was that the differences in income and remuneration were mainly related to the activities. So, to deepen the analysis, the average income of the activity/job performed by gender was calculated. As shown in Table 4, the differences in income occur because men are in higher hierarchical positions. Furthermore, when we analyze the average income in each job/occupation, we see that in all cases (except for farming on the family farm and research and teaching activities), the income of male graduates is higher than female graduates ones. Thus, the data shows that the differences in income between men and women are due to women's difficulty in reaching higher hierarchical positions and lower pay, even when performing identical functions.

Table 4
Average income by occupation

Decitions/professional activity	Average income			
Positions/professional activity	Men	Women		
Administrative and administrative management positions	12,5	3,0		
Positions directly related to area of degree	5,7	4,0		
Positions indirectly related to area of degree	5,1	3,1		
Positions not related to area of degree	3,5	2,2		
Positions in public bodies related to area of degree	5,7	3,9		
Positions related to the marketing of supplies/implements/commodities	10,3	4,3		
Entrepreneurial activity related to agribusiness	7,1	3,9		
Entrepreneurial activity not related to area of degree	9,3	3,8		
Entrepreneurial activity in rural production	11,9	4,0		
Technical management positions	6,8	4,6		
Research and teaching	5,5	8,2		
Rural activity on the family farm	5,1	5,9		

<sup>\*</sup> Average income in minimum wages.

Source: Elaborated by the authors.

It is important to note that the category of "women" is not homogeneous; therefore, it is necessary to consider the dimension of race to better understanding the integration of these professionals. When asked about the income of black female graduates, the situation is even more critical: 64% of them have an income of up to 2 minimum salaries; the average income of black women is 2.2 minimum salaries, which contrasts significantly with the average income of men: 6.9 minimum salaries.

The study compared the current level of education of men and women to see if this factor could explain the difference in income. The data (Figure 1) shows that, to a greater extent, women have continued their studies and are the majority of those with postgraduate and master's degrees. Consequently, their level of education is higher than that of men. Thus, women's lower pay is not related to their level of education since they combine higher levels of education with lower incomes.

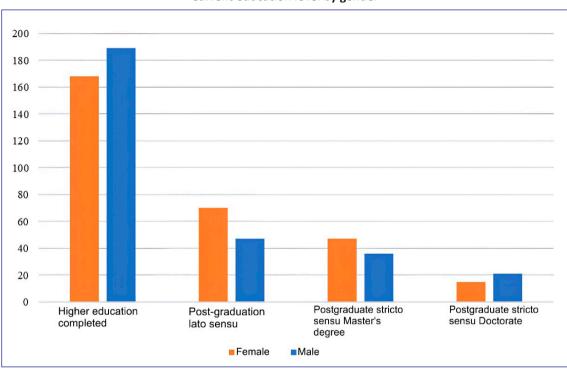


Figure 1
Current education level by gender

Source: Elaborated by the authors.

# Main activities performed by men and women

The working respondents' positions were analyzed to identify whether the activities performed by men and women were the same. By grouping and summarizing the positions, we came up with Table 5, which shows the main professional activities performed, broken down by gender. As can be seen, more women than men are in administrative positions. Women are also in the majority among those who work in positions unrelated to training and are in the minority in positions related to the marketing of inputs, technical management, research and teaching and among those who are entrepreneurs. Only when the activity is unrelated to their degree area are more women than men in entrepreneurship. The number of women working on family farms is slightly lower than that of men. The number of women in public positions related to their degree area is noteworthy: 8% women and 2% men in this position.

Table 5
Main professional activities performed by gender

Positions/professional activity	Men	Women	
Administrative and administrative management positions	11%	16%	
Positions directly related to area of degree	12%	11%	
Positions indirectly related to area of degree	18%	22%	
Positions not related to area of degree	6%	7%	
Positions in public bodies related to area of degree	2%	8%	
Positions related to the marketing of supplies/implements/commodities	20%	13%	
Entrepreneurial activity related to agribusiness	5%	3%	
Entrepreneurial activity not related to area of degree	1%	3%	
Entrepreneurial activity in rural production	3%	0%	
Technical management positions	11%	10%	
Research and teaching	9%	5%	
Rural activity on the family farm	3%	2%	
Total - sample	100%	100%	

Source: Elaborated by the authors.

The influence of gender on work inactivity

Bearing in mind that the number of women exceeds the number of men who are unemployed or out of the workforce, a logistic regression model was developed to measure whether there is an influence of gender on the dependent variable "professional situation" (indicating whether the graduate is working) and whether other variables could also explain inactivity. It was possible to generate the model after testing the collinearity of the variables and identifying that they did not exist before carrying out the analysis. The proposed logistic regression model proved to be valid, given that:  $X^2$  (1) = 25.879, p (significance) < 0.05.

The model's explanation of variance ranged from 0.043 (Cox & Snell) to 0.071 (Nagelkerke). The model's predictions are 7% correct, i.e. it is able to explain 7% of the changes recorded in the "professional situation" variable. At first glance, the model's explanatory power seems limited since many factors would influence the graduate's professional situation. Nonetheless, the model is relevant because it indicates how the variables in question affect this condition.

The dependent variable was "Professional situation: are you currently working?", which is a binary variable, and the independent variables were: a) "Gender"; b) "Age"; c) "Did you continue your studies after graduating?". The results of the regression (Table 6) show that the variable "Gender" has a causal relationship with the dependent variable "Professional status", given that the significance level is 0.000. Causality can be considered direct since the regression coefficient (B) is positive. The variable "Professional status — are you currently working?" was coded as "1-Yes" and "2-No" (with "2-No" being the reference category); while the variable "Gender" was coded as "1-Female" and "0-Male". The other variables in the model, as shown in Table 6, are not statistically significant, i.e. they do not influence the dependent variable.

Table 6
Binary logistic regression result

Variable	В	S.E. (Default error)	Wald	df	Sig.	OR*
Gender(1)	1,105	0,241	21,014	1	0	3,018
Age	-0,03	0,031	0,945	1	0,331	0,971
Studied_after_grad_DICOT(1)	0,187	0,31	0,365	1	0,546	1,206
Constant	-1,395	0,921	2,292	1	0,13	0,248

Source: Elaborated by the authors.

As shown in Table 6, the OR value = 3.018 indicates that as the predictor "Gender" increases, so does the chance of "Work status = 2" (not working). Thus, it can be said that a female graduate is three times more likely not to be working than a male graduate.

Other variables were included in the model, such as age, having done an internship, parents' schooling, the course is taken, and the institution where the higher education course was taken. However, none of these proved to be statistically significant, so it was impossible to affirm the existence of an association with the dependent variable.

# **DISCUSSION**

The labor market is marked by significant gender inequality, which reveals unfavorable situations for women. Given this fact, this study sought to analyze the conditions under which graduates from public educational institutions in Goiás in Agricultural Sciences and Agribusiness Technology enter the job market. The aim was to verify the reality experienced by graduates and the inequalities related to work that affect them. The findings of the research indicate, in line with other studies (Barros et al., 2019; Menezes & Silva, 2016; Pereira et al., 2011; Silva & Redin, 2020; Szöllösi & Dias, 2017), that women face occupational segregation, wage discrimination and difficulty in professional advancement. This scenario is mainly the result of the sexual division of labor, which gives women positions of less prestige, power and remuneration (Hirata, 2015; 2018; Hirata & Kergoat, 2020). The findings also reveal that occupational segregation, the difficulty of professional advancement and wage inequality — the main forms of gender inequality at work reported in the literature (Acker, 2006; Biroli, 2018; Fernandez, 2019; Hirata, 2015; Thome & Melo, 2018) — mark the professional performance of female graduates from higher education courses in Agricultural Sciences and Agribusiness in Goiás. The typologies of professional insertion created highlight the occupational segregation in agribusiness, showing that occupations directly linked to this sector are more contested and have a lower female representation.

Even though the number of women graduating from higher education courses in the agricultural sciences is proportionally similar to that of men, they don't manage to achieve the same positions or types of professional insertion. This indicates that, in the agribusiness sector, there is still a preference for hiring men. The positions that women get in this sector are hierarchically lower, with lower pay. Even though they perform the same activities, their income is lower. These findings corroborate the considerations of Acker (2006), Alves and Cavenaghi (2012), Haussmann et al. (2018), Hirata (2018), Melo and Thomé (2018), T. T. R. W. Proni and M. W. Proni (2018) and Vaz (2013), who highlight the disadvantages and discrimination experienced by women when entering the job market. On the other hand, the results contradict the conclusions of Borges et al. (2021), who state that women have managed to expand their professional insertion and break down existing barriers in the agricultural sector.

The survey indicated that women predominate in public institutions, which can be explained by the fact that these institutions have a less discriminatory selection process, given that access to public employment depends on passing competitive exams (Vaz, 2013).

The results also reveal that there are twice as many women in administrative roles compared to men, which reflects the principles of the sexual division of labor, which assigns women to support roles while men are in charge of technical and strategic activities (Biroli, 2018; Hirata & Kergoat, 2007; Kergoat, 2009). In addition, women represent the majority of those who occupy positions unrelated to their training (17%).

The positions held by women are hierarchically lower and less related to their area of training. Concerning advancement to managerial positions, the results show that female graduates' access to these spaces is restricted: of the 15%, 10% are in technical management and 5% in administrative management. This conclusion is similar to those of Borges et al. (2021), Oliveira and Serra (2018), and Pereira et al. (2011), who found that although the number of women in the agribusiness sector has increased, the number of men, especially in management positions, is higher. This indicates that the "glass ceiling," as pointed out by Oliveira and Serra (2018), persists in agribusiness.

The analysis of the type of professional insertion also showed that women are in the minority in generational succession (7%). However, proportionally, the percentage of female successors is higher: among the children of farmers, the percentage of men who became successors was 16%, and of women, 21%. This result partially contradicts the majority of studies, which point out that women have sought other alternatives for entering the job market in the face of a succession process that traditionally favors male heirs (Breitenbach & Corazza, 2020; Brumer, 2004; Brumer et al., 2008). However, observing that women's work on family farms takes place at the same time as other professional activities and that the majority do not receive any remuneration for succession-related activities reveals a picture in which women, despite their role as successors, do not have the same opportunities as men. This highlights other glass ceilings above women's heads and those traditionally described in the literature (Fernandez, 2019; Vaz, 2013). Parental encouragement and investment in machinery appear to be important issues for children to take on the succession, as evidenced by Breitenbach and Corazza (2020), Colle (2016), and Pessotto et al. (2019). Heirs seem more motivated to take charge of succession on more structured, larger, and more prosperous farms (Bertoni & Cavicchioli, 2016; Cavicchioli et al., 2018).

Women were also in the majority among the unemployed (17%) and professionals outside the labor force (7%), corroborating IBGE data (2022). Factors such as the number of children in the household and greater responsibility for household chores and caregiving help explain the predominance of women among the unemployed (Cabral & Veronese, 2020; Hirata, 2015; Thome & Melo, 2018).

The situation for black women is even more serious. This group has the lowest income of all the others (64% of them have an income of up to 2 minimum wages), which clearly points to the existence of inequalities related to skin color within the female group itself. This result reinforces the considerations of Biroli and Miguel (2015), Hirata (2014), and Hirata et al. (2009), who understand that oppressions are multiple and complex and that it is not possible to understand inequalities when analyzing one variable in isolation. The case of the agribusiness sector is no exception: black graduates face more unfavorable job opportunities compared to other groups.

# **FINAL CONSIDERATIONS**

The findings of this study endorse the view that Brazilian women have achieved partial victories throughout history, such as increased levels of education and greater inclusion in the labor market. However, they are still poorly represented in many areas and suffer from occupational segregation and wage discrimination. Women's participation in the agribusiness sector reflects these asymmetries and reveals that there is still much to be achieved.

In terms of contributions, this study sought to broaden the scope of agribusiness studies by incorporating gender studies literature. Conducting a survey, the results of which were analyzed through the lens of gender studies, revealed that this sector is strongly marked by patriarchy. This study has also contributed to the gender literature by revealing the subordinate presence of women in an economic sector little studied by feminists, reinforcing the understanding that, although women are present in the job market, they continue to face obstacles to their insertion and ascension in certain sectors. Another contribution that the findings make to gender studies concerns the phenomenon of the "glass ceiling" in the process of succession in the management of rural properties, which does not exclude women from business management, but assigns them to less important positions, often without pay.

This is also an advance on previous studies on agribusiness (Barros et al., 2019; Borges et al., 2021; Menezes & Silva, 2016; Pereira et al., 2011; Silva & Redin, 2020; Szöllösi & Dias, 2017), since the scope of this research is broader, as it covers all higher education courses in agricultural sciences and agribusiness and expands on the possible paths taken after graduation. This includes the path of generational succession, comparing the situation of women and men. Quantitative methods are also used to establish causal relationships. Unlike previous studies, this research identifies that the difference in pay is related to the difficulty of ascending to higher positions and points out that, even when occupying identical positions, women receive lower salaries than men. Furthermore, in contrast to previous studies, this research establishes a relationship between schooling and pay and shows that this relationship does not exist, especially for women. This study also makes progress by proving, with quantitative data, that gender influences unemployment, pay and positions held. It is also worth noting that previous studies had not identified working in the public service as a possible alternative to avoid discrimination and enable women to work in their degree area, earn an income, and move up the career ladder. This finding is relevant and could contribute to the future professional integration of women.

In practical terms, the study's findings could be useful for universities offering agribusiness-related courses to direct their actions towards increasing the employability of female graduates. For companies operating in the sector, the study can provide insights into the development of strategies to make the sector less refractory to the presence of women. For public authorities, the research reinforces the importance of policies to combat gender inequality and discrimination.

As far as limitations are concerned, although the choice of quantitative research enabled a comprehensive picture to be drawn up of the integration of graduates from agribusiness-related courses, it did not make it possible to delve into the subtleties and specificities underlying the inequalities observed. It is therefore suggested that future qualitative research be carried out with this same audience to gain a deeper understanding of the challenges women face as they enter the agribusiness profession, as well as explain the nuances of the generational succession process.

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Cássia da Silva Castro Arantes: Conceptualization (Equal); Data curation (Lead); Formal analysis (Lead); Funding acquisition (Lead); Methodology (Supporting); Project administration (Equal); Writing- original draft (Lead); Writing- review & editing (Equal).

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Gabriel da Silva Medina: Conceptualization (Equal); Formal analysis (Supporting); Methodology (Supporting); Project administration (Lead); Supervision (Lead); Writing-review & editing (Equal).

José Elenilson Cruz: Conceptualization (Equal); Formal analysis (Supporting); Methodology (Supporting); Project administration (Equal); Supervision (Equal); Writing-review & editing (Equal).

## DATA AVAILABILITY

The entire dataset supporting the results of this study is available on request from the corresponding author Cássia da Silva Castro Arantes. The dataset is not publicly available because it contains personal information that could compromise the privacy of the research participants.

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