



Analysis of aviary reform planning in the Northwest Region of Paraná – Brazil

Análise do planejamento de reforma de aviário na Região Noroeste do Paraná - Brasil

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ABSTRACT

Brazil is the third largest producer and exporter of chicken meat in the world, with an average production of 14,500,000 tons/year, of which 4,225,000 of them are exported (EMBRAPA, 2023) In Brazil, Paraná is the largest producer of chicken meat, being responsible for the production of about a third of the national production (IBGE, 2022). For there to be this production of chicken meat, poultry farms are indispensable.

Keywords: Aviary, Production, Chicken Meat.

RESUMO

O Brasil é o terceiro maior produtor e o maior exportador de carne de frango do mundo, com produção média de 14,500,000 toneladas/ano, sendo 4,225,000 delas exportadas (EMBRAPA, 2023) No Brasil, o Paraná é o maior produtor de carne de frango, sendo responsável pela produção de cerca de um terço da produção nacional (IBGE, 2022). Para que possa haver essa produção de carne de frango, os aviários são imprescindíveis.

Palavras-chave: Aviário, Produção, Carne de frango.

1 INTRODUCTION

Brazil is the third largest producer and exporter of chicken meat in the world, with an average production of 14,500,000 tons/year, of which 4,225,000 of them are exported (EMBRAPA, 2023) In Brazil, Paraná is the largest producer of chicken meat, being responsible for the production of about a third of the national production (IBGE, 2022). For there to be this production of chicken meat, poultry farms are indispensable.

Aviary can be understood as a long rural building (the length can be about 10 times the measure of width) that aims to house chicks and fatten them until they become broilers of an appropriate age for slaughter. For this, one must have control of temperature, humidity, lighting, etc. (LOVANH et al., 2007).

There are two main types of aviaries: closed-sided and open-sided. The closed side have negative ventilation to cool the aviary, leaving the evaporative plate or inlet at one end of the aviary and exhaust fans or outlet at the other (COBB, 2009), while the open-sided use positive ventilation, fans spread evenly throughout the aviary.



Another difference is how much lighting. While the closed-side has greater luminosity control, the open-sided uses natural and artificial lighting without as strict a control as the closed-side. As for temperature, it can vary from 14.6°C to 29.2°C in closed-sided aviaries and from 12.9°C to 30.1°C in open-sided aviaries. In addition, aviaries have a high relative humidity, which can vary from 50.7% to 99.9% for closed-sided and from 47.4% to 99.9% for open-sided (SANS et al., 2021).

To do the analysis of the physical schedule, it is common to analyze from the Gantt Diagram and the PERT-CPM. The Gantt diagram has as inputs the services that will be executed from the project by a timeline that goes from the beginning to the end of the project activities (SILVA, 2020; SILVA et al., 2018; ULBRICHT; SANTOS; MOURA, 2020). This diagram can be associated with other deadline management methods, most notably the PERT/CPM method.

The PERT/CPM method is a method created from two methods. The PERT method (Technical Evaluation and Review Program) is a method that serves to evaluate the expected time for a given activity through scenarios (pessimistic, optimistic and probable). The CPM method is a method of evaluating the critical path that a given process will have, that is, sequence of activities within the scope of project activities that if there is a delay, the entire project will be delayed provides (ULBRICHT; SANTOS; MOURA, 2020; VERGARA; TEIXEIRA; YAMANARI, 2017). With this, the combination of these two methods in one shows an estimate of how long it is possible to develop a project or an engineering work. It is worth mentioning that the CPM method is an ideal method for allocating time to non-repetitive services (AMMAR, 2013; EL-NAWAWY; ETMAN; SANAD, 2020), as is the case with an aviary refurbishment.

2 GOAL

The objective of this study was to compare the planning that was carried out and proposed through this study in an aviary renovation project in the northwest of Paraná - Brazil

3 METHODOLOGY

This is a case study of an aviary in the northwest of Paraná, Brazil, where the costs, deadlines, scope and quality of the services performed in loco were analyzed. For this, photographic records that the owner provided for the study were analyzed. In addition, interviews with the owner and executor of the work were analyzed.

From the analysis, they were classified according to the evidence, the failure, the type and the possible prevention of the failure. In addition, from the content and dates of each photograph, a retroactive analysis of the data was made and recorded in a Gantt diagram. With the activities recorded, it was determined, from the data of SINAPI (2021), the duration and cost to accomplish what was recorded. Then,



from the activities performed recorded and the physical financial schedule determined, it was discussed what could be done to possibly increase the durability of this construction.

4 FINDINGS

From the metadata, provided by the owner of the aviary, it was possible to map some of the problems, the cause and a possible prevention of the problem for future works, as shown in Chart 1. With the duration of each activity, the part of Chart 2 was elaborated.

Table 1: Mapping of problems in the implementation of the aviary reform

EVIDENCE	FAULT	POSSIBLE ORIGIN	POSSIBLE PREVENTION
Absence of baldrame beam below the masonry of 30 cm high;	Incorrect execution of the baldrame beam	- Economy of materials / services - Lack of technical training of the master builder	- Execution of baldrame beam, even if at a height that supported only the 30 cm high of tile
In an interval of two days, the whole process of plastering and plastering were done on a third of the walls; Detachment of the inner lining.	Possible absence of chapisco	- Economy of materials - Addiction to practice	-Execution of the chapisco for the prevention of the fall of mortar coating;
	Possible absence of taliscamento	- Practice addiction	- Execution of the taliscamento for the reframe of the openings and plumb of the coating;
Throughout the period analyzed, it is not possible to observe waterproofing marks on the structure.	Possible absence of waterproofing	- Economy of materials - Addiction to practice	-Execution of waterproofing in the beams baldrame and foot of pillars; -The waterproofing agent can not interact with the chicken litter or harm the health of the birds;
It is possible to observe in the photographs both the concrete and the whitish mortar.	Porous concrete	- Excess water in concrete - Concrete curing failure	-Decrease the water cement ratio; -Carry out the curing process of the concrete;

Table 2: Gantt diagram for what was performed and proposed in this study

SERVICES	Dec/20															jan/21																																									
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																				
DEMOLITIONS AND REMOVALS	1	1																																																							
FOUNDATION																																																									
STRUCTURE																																																									
MASONRY																																																									
MORTAR COATING																																																									

accomplished
 proposed



From the activities carried out on site, the physical financial schedule was proposed, which the summary is presented in the Table 1 and the BDI referent is detailed in Table 2. The PERT-CPM diagram of the Figure 1 and with that, assemble the proposed part of the Gantt diagram of Table 2.

Figure 1: PERT-CPM diagram for the proposed activities

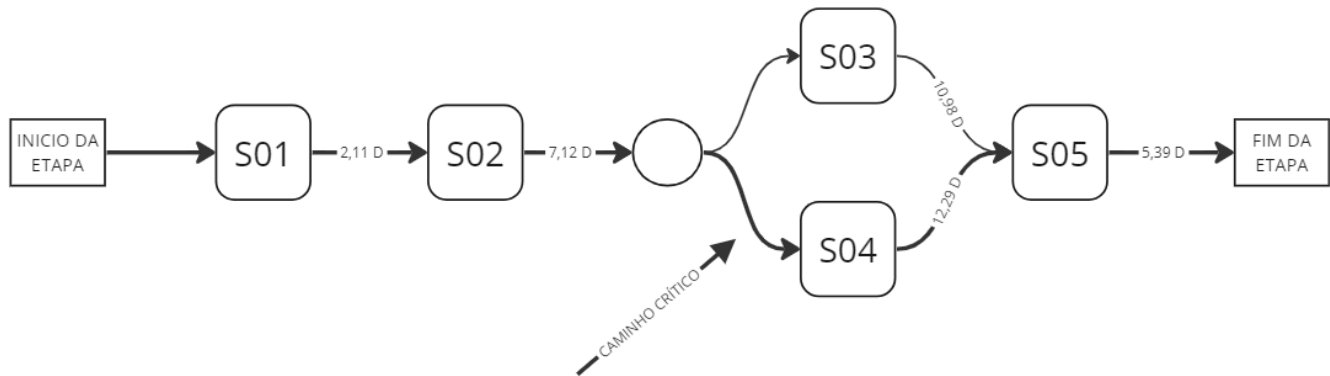


Table 1: Summary of proposed total costs and times

Code	Description	Total price with BDI	Proposed Period
		(R\$)	(Days)
-	REGISTERED REFORM OF AVIARY	110.003,30	26,91
S01	DEMOLITIONS AND WITHDRAWALS	1.757,79	2,11
S02	FOUNDATION	16.571,03	7,12
S03	STRUCTURE	56.563,68	10,98
S04	MASONRY	23.093,87	12,29
S05	MORTAR COATING	12.016,93	5,39

Table 2: BDI Description Table

Items	Acronyms	% Adopted
Central government	AND	7,00%
Insurance and Warranty	SG	5,00%
Risk	R	10,00%
Financial Expenses	DF	5,00%
Profit	L	10,00%
Taxes (COFINS taxes 3%, and PIS 0.65%)	CP	3,65%
Taxes (ISS, variable according to the municipality)	ISS	0,00%
Taxes (Social Security Contribution on Gross Revenue - 0% or 4.5% - Exemption)	CPRB	4,50%
BDI NO exemption	BDI PAD	46,25%



5 DISCUSSION OF RESULTS

Regarding the quality of the services performed, the excessive saving of expenses may have caused losses in the quality of the services performed. This can be observed in the Table 1, where it is possible to observe that, several times, the saving of material may have been a possible cause of the failure. Another possible origin of several of the failures were the addiction of the practice, that is, actions taken in practice that can cause damage to the construction in the short, medium or long term. This could have been avoided if someone who had theoretical and practical knowledge of planning and execution of aviary works had decision-making power vis-à-vis those who executed the enterprise.

5.1 AS CAN BE SEEN IN THE

Frame 2, what was performed had a shorter duration than the one proposed. This may originate (i) in the unexecuted steps of the performed, (ii) in a possible increase of the deadlines by the table of the SINAPI (2021) and (iii) intercalation of activities, making more use of the execution time. In relation to item (iii) one hypothesis is that those who performed the work were multipurpose officers. With this, there are indications of the failure of the Gantt diagram method and the PERT-CPM for this situation.

As for the financial analysis of the proposed costs of the work, present in the Table 1, was elaborated from the quantitative of the physical schedule. However, there is no way to compare with what was executed, because it was not informed how much was spent for the execution of this part of the aviary.

6 FINAL CONSIDERATIONS

Cancer patients suffer several effects resulting from the treatment, it is necessary to establish conducts that help the patient to deal with the treatment and its effects, minimizing the impacts on their self-esteem and well-being. Integrative therapies effectively and safely reduce physical and emotional symptoms. These therapies provide a favorable risk-benefit ratio and allow cancer survivors to help manage their own care.

Therefore, it can be stated that there were failures of execution due to the vice of practice and economy of materials essential for the good progress of the work. In addition, there are indications that it was not possible to model the physical schedule both by the non-execution of the services listed, and by the increase of the deadlines by the SINAPI table and by the versatility of the officers.



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