

## **Implementation of improvement in a production line for the production of meat in canal and primary cuts**

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Received August 12, 2016; Accepted November 5, 2016

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### **Abstract**

This research is the implementation of tools for process improvement in a company that is dedicated to the production, sale of meat carcasses, primal cuts, using flowcharts from the platform shipments, slaughter area, viscera , salted skins, boning area, performance area and conservation chamber and cooling in order to identify areas of opportunity for eliminate downtime, eliminate rework and identify opportunities for improvement using time and motion study for increase productivity within the company. The time and motion study was conducted throughout the process from the arrival of the beef until obtaining meat channel, all areas was analyzed to determine the time of each of the activities through random sampling for determine the standard time and distance of each activity today is of great importance to partake in continuous improvement to be more competitive in the workplace.

### **Enhancement tools, slaughter area, viscera, downtime and productivity**

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**Citation:** ANTONIO-ANTONIO, Alejandrina, MEZA-MORALES, Martha Isis, VAZQUEZ-FERNANDEZ, Jorge, Alberto, RUIZ-PEREZ, Cinthia Daniela. Implementation of improvement in a production line for the production of meat in canal and primary cuts. ECORFAN Journal-Bolivia 2016, 3-5:1-6

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## Introduction

The research was very useful because the results of implementing the improvement in a production line were obtained for the production of meat in the channel and primary cuts production process, from the entry of matter to finished product, using support tools such as diagrams of flow, at the same time was determined the standard time of each of the tasks of said process eliminated dead time, rework and waste. First, the study of each activity was done carefully and the time of each task was measured. The observation was carried out in a visual and random way. In this investigation, only the flow diagram of boning up to the stage of shipments is shown. It allows us to determine the activities of the process together with the help of the common chronometer. The chronometer is used to determine the standard time of each activity this allows us to optimize the process and increase the productivity of the same.

The objective of the improvement is to implement methods to optimize the production line to obtain the meat in the channel and the primary cuts from the entry of the raw material to finished product with the purpose of reducing downtime, eliminating rework and eliminating waste using Work tools such as flowcharts.

## Method description

Operator selection: workers must be able to perform their activities in the best possible way and above all must have good skill and effort. But nevertheless.

From any point of view, it is better that the method analyst should be based on the observations of an effective and cooperative worker working at the acceptable performance level, to achieve good results.

Show the working methods and readings of the time study: the time study should not be considered as a secret document confined to the use of analysts. It should be an accurate record of informative data covering the best and most efficient way of doing the work under the expected conditions when the work is being done.

Explanation to the operator and line supervisor: the analyst should be courteous, courteous and sincere to show recognition and respect for the problems of the operator, the analyst should be frank in dealing with the operator on matters of operations to be studied and on Time studies. The analyst must be able to explain in clear terms and without technicalities, all the actual timing procedures.

## Advantages of time study by element

- Evaluate performance more accurately.
- Determine changes in work items or their sequence when time standards have to be revised.
- Create standard time values for frequently recurring items; these can be checked against existing data, which helps to maintain the consistency of the data.
- Identify non-productive work.

**Timing record with the technique reset to zero**

This procedure is the one that gives the best result in general and in almost all elementary operations are recorded in the order in which they are performed and when taking time of an activity the timer should be left at zero to take the time of the other activities.







The method analyst lets the timer go through each activity throughout the study period, making the observation. You must do all this with enough speed and concentration to be free, in order to observe and write the time that the operation ends with the technique to zero. The zeroing technique does not provide the most accurate time of activities for each operation.






















**Method Analyst Responsibilities**



















1. Test, question and examine the current method, to ensure that it is correct in all respects before setting the standard.
2. Analyze with the supervisor, equipment, method and skill of the operator before studying operations.
3. Answer the questions related to the time study technique that could be made by the operator and the supervisor.
4. Always collaborate with the supervisor and the worker to get maximum help from them.
5. Abstracting from any discussion with the operator involved in the study or with the operators and what could be interpreted as criticism or censorship of the person.
6. Show the complete and accurate information in each study at the time made to specifically identify the method being studied.
7. Carefully note the measures of the times corresponding to the elements of the operation being studied.




















8. Evaluate with honesty and justice the activity of the operator.

Below is the flow diagram of the area of boning to the area of shipment anden, it is mentioned that the study was made in the whole process from the reception of the res to the boarding area and primary cuts. Only one part of the process is shown

Process Flowchart				
Diagram object: Area of Dehuee up to Anden de Embarques				
Part: First Method Diagram: Actual Sheet: 1 of 1				
The diagram begins in: conservation area				
The diagram ends in: shipping area				
Preparation: AAA date: _____		Preparation: AAA date: _____		
I hereby authorize: XXXX signature: _____				
#	Distance	Symbol	Time	Description
1	33.10 m		16.82 s	The area of conservation is transported the area of boning.
2	1.50 m		2.19 s	The piece of meat is sprayed into the canal to sanitize.
3			3.28 s	The channel is inspected for any dirt on the channel.
4	2.50 m		36.42 s	Cut the front quarter of the canal and cut the leg.
5			8.22 s	The leg is torn and deposited in the tare.
6			20.44 s	The front quarter of the channel is broken and is accommodated in the tare.

7	7.2m		17.71 s	It is transported in the mountains.
8	14 m		20.23 s	The beef leg is transported to the cutting area.
9	3.70 m		28.21 s	The front quarter is cut into 4 parts which is the chuck, neck, chest and crossbar.
10	14 m		1.29 s	It is deposited in the tare.
11	1.10 m		15.21 s	It takes time, because the operator is waiting for him to finish cutting the front room.
12			35.96	The front leg is boned.
13			1.10 s	The meat is sanitized
14			3.26 s	Cut some greasier parts.
15	2.10 m		11.53 s	Packaged
16			51.49 s	The bag is sealed
17			1.47 s	Fits in with the taras
18			31.37 s	The meat in the canal is transported to the area of desfalde
19			15.34 s	The skirt is cut
20			15.05 s	Delay, because the operator is waiting for other taras
21			15.91 s	Move the cutting area
22			28.27 s	Cut the greasier parts
23			2.19 s	Moves to the sanitization area
24			39.29 s	Packaged
25			51.49 s	The bag is sealed
26			15.77 s	Fits in with the taras
27	3.37 m		28.39 s	The other quarter of the channel is cut
28			16.94 s	The channel is cut

29			2.00 min	Delay, the operator leaves the work area
30			3.55 s	The channel is moved in the area of the saw.
31			7.28 s	Cut in the saw the 3 parts that are the rib, needle and thigh
32			3.47 s	Fits in with the taras
33	0.60 cm		37.15 s	The operator removes the tare and puts it on the work table to remove greasier parts
34			3.27 s	The sanitization area is moved
35	0.24 cm		25.36 s	It pockets
36			1.16 min	The bag is sealed
37			3.38 s	Inspected if well sealed
38			15.77 s	Fits in with the taras
39			5.27 s	Delay, the operator waits for the other operator to finish translating the tare
40			1.26 s	A small opening is made in the leg, to change the position of the roll
41	2.40 m		16.02 s	The ball that is next to the leg is cut
42	2.4m		28.00 s	The hip of the res
43	3.63 m		35.96 s	The leg of the beef is boned
44	0.70 cm		35.35 s	It is transported to the cutting area
45			5.28 s	Delay, because the operator performs another activity
46	3.63 m		7.27 s	The leg bone is removed and settled in the tare

47			36.24 s	It takes time, because you have to wait until the saw
48			9.47 s	The chamberete is started and deposited in the tare
49	7.30 m		11.24 s	It is transported in the mountains
50			6.24 s	The bone is cut (tuetano) and deposited in the tare
51	1.10 m		2.46 s	The chamberete cuts the greasier parts
52			3.26 s	The chamberete is sanitiza
53	2.80 m		5.24 s	The chamberete is pocketed
54	0.90 cm		51.49 s	The bag is sealed
55	0.30 cm		3.00 s	Sealing is inspected
56			15.77 s	Fits in with the taras
57			13.51 s	Moves to the waiting area
58			14.28 s	Tards are transported to the pre-cooling area
59			26.67 s	The boxes are assembled
60			68.78 s	The meat is accommodated in packaging boxes which is the chuck, half chest and needle
61			29.77 s	Fits the paw in the boxes and packs
62			68.78 s	Fits the front room, the shoulder, cross, neck and chamberete
63	35.20 m		3.11 min	Moves to the anden
64	0.60 m		24.22 s	Weighed and recorded
65	10 m		55.35 s	Is transported to the truck

**Table 1** Este diagrama muestra el proceso del área de deshuese hasta el andén de embarques

Summary			
Event	Number	Time	Distance
Operations	43	26.38 min	225.56 m.
Inspections	3		
Transport	13		
Delay	6		
Total	65		

**Table 2**

## Results

During the realization of this research of improvement in the production line, it was possible to determine the improvement of the production line with the determination of standard times of the different activities in the company from the entrance of raw material until obtaining meat in channel and cuts With a time of 52.7 min, salting of skins 2.59 min, area of boning 26.38 min, chamber of preservation 2.21 min, area of viscera 5.48 min, Yield 4.18 hours, this method is very important for the aforementioned areas because it facilitates the understanding of the workers and will know what activities to perform. It is also possible to have a control in the production areas and to correctly apply the procedure for the execution of tasks.

## Conclusions

This research used the flowchart to determine process optimization from the input of raw material to finished product, this facilitates the operarios to know what activity proceeds, also allows to detect process dead time, eliminate wastage and rework, and eliminate necks Of bottle

The tool was very useful for the development of the research of improvement in a production line for the obtaining of meats in channel and primary cuts, obtaining like result to determine the standard time of each area such as: 52.7 min of slaughter until Chambers pre-cooling / viscera, 2.59 min.

Salted from skin to shipments of skin, 28.59 min. In the area of boning until shipments of channels, 5.48 min. Chamber of viscera until shipments of viscera. 4.18 hours in the performance area. With a total of 5 hours, 49 min, 50 seconds.

Throughout the process, a sample of the diagram of a department is described, due to the confidentiality of the company. The good time analyst must have the mental capacity to analyze the most diverse situations and make the right and fast decisions. Have the necessary practical instruction in the area in which standards are to be established. For the company it was very useful to count the flow diagram because it allows them to know the process to be performed during the operation and facilitates the execution of tasks.

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