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# Application of the MASP tool for continuous improvement in a food industry

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**ABSTRACT**
Today's industrial environment demands more critical observation of its processes every second in order to achieve marked continuous improvement, due to the bold demands of the market. For this reason, since the 16th and 17th centuries in the great Scientific Revolution that broke out in Europe, the scientific methods that we know to this day and which make a difference in large companies and their processes have been followed and implemented.

**Keywords:** MASP, Food industry, Market.

## INTRODUCTION

Today's industrial environment demands every second a more critical observation of its processes in order to improve continuously due to the bold demands of the market. For this reason, since the sixteenth and seventeenth centuries in the great Scientific Revolution that broke out in Europe, the scientific methods that we know to this day and that make a difference in large companies and their processes have been monitored and implemented.

One of the major problems of most companies is the control of their raw material, the inventory, from its purchase, receipt, to its processing process. In this sector there are great possibilities of losses, waste and even the lack of the main materials that are needed for the production line. If there is no perfect logistics control, there will be process failures, loss of productivity and even customer dissatisfaction when there are disruptions in the market.

According to data from the Brazilian Food Industry Association (ABIA), the industrial sector has only grown in revenue numbers since 2013. Even with the economic and financial crisis in Brazil in mid-2014 to 2016, there is a total growth of more than 15% in this period. The share of GDP in 2018 reached 9.6%. This scenario requires from large producers an increasingly better planning, acquisition of technologies and automation of their resources, the control of these and the main one, the continuous and efficient improvement, generating satisfactory results.

The purpose of the modern organization is to implant, in its culture, the concepts and actions of continuous improvement. The employee who joins one of these organizations has to think daily about how to improve his sector at every moment, generating great results for his employer. With that, all the

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company's chain tends to think the same way, from the operational to the top management of the company, and so the organization is improved in all aspects, at all times.

With this in mind, we saw the opportunity to implement the MASP tool in a sausage industry in the state of Ceará, to solve some problems faced in the daily receipt of its raw materials, harming the progress of the production line, with delays in delivery, use of non-conforming and non-standard raw materials and low quality product. This company in question reports difficulties in meeting its production demand, due to errors such as the use of spoiled raw material, with a critical expiration date (with a few days left to expire), or even emergencies in which a standard supplier does not deliver the raw material on time and needs the service of another supplier. As a consequence, there is a wrong flow, conducive to generating food safety problems and loss of sales.

The work took place with the collection of data and information so that, through tools such as Pareto Diagram, Brainstorming and Ishikawa Diagram, it was possible to create an appropriate action plan to act on the main causes of the problem. After the implementation of the action plan, data collection was necessary again to compare initial and final data in order to verify the efficacy of the study. With this, create a standard procedure and train those involved for the application of the new process and dissemination of continuous improvement.

## OBJECTIVE

The main objective of this article was the application of the MASP (Method of Analysis and Problem Solving) tool to solve problems in the process of receiving raw materials from a food industry, with delays in delivery, use of non-conforming and non-standard raw materials and low quality product, thus improving the receiving flow and increasing the productivity of the production line.

## METHODOLOGY

According to the purpose of the present work, it is classified as applied research. It focuses on the problems present in the activities of institutions, organizations, groups or social actors. She is committed to making diagnoses, identifying problems and finding solutions. It responds to a demand formulated by "clients, social actors or institutions" (Thiollent, 2009, p.36).

In relation to the general objectives intended, it is called descriptive research. According to Vergara (2000, p.47), descriptive research exposes the characteristics of a given population or phenomenon, establishes correlations between variables, and defines its nature.

The type of approach of the present work was qualitative, in which the author himself is an essential tool, because he is the one who analyzes the collected data, seeking the concepts, principles, relations and meanings of things. According to Silva & Menezes (2000, p. 20), "qualitative research

considers that there is a dynamic relationship between the real world and the subject, that is, an inseparable link between the objective world and the subjectivity of the subject that cannot be translated into numbers. The interpretation of phenomena and attribution of meanings are basic in the qualitative process. It does not require the use of statistical methods and techniques. The natural environment is the direct source for data collection and the researcher is the key instrument. The process and its meaning are the main focuses of the approach."

As for the technical procedure for data collection, the method used is field research, making use of questionnaires, on-site interviews with people involved in the case, collecting data for future detailed analysis and possible solutions.

According to Gonsalves (2001, p.67), field research is the type of research that aims to seek information directly from the population studied. It requires a more direct encounter from the researcher. In this case, the researcher needs to go to the space where the phenomenon occurs, or has occurred, and gather a set of information to be documented [...].

## PRESENTATION OF THE COMPANY

The company, the field of application of the research, is a Sausage Industry that is installed in an industrial district in the state of Ceará and produces mortadella, snacks (ham), boiled sausages, chilled and frozen sausages, and ground beef. It has a brand present in more than 180 municipalities in the state, with a greater focus on service in the C and D classes of the market, which currently represents more than 80% of the population. It stands out for the volume produced daily, which requires a solid and precise planning of receiving its raw materials, most of which come from outside the state, as Ceará is not a pioneer in meat production. One of the raw materials most used in processing in this company is beef. According to IBGE data (2018), it is produced in greater volume in the states of Mato Grosso, Mato Grosso do Sul and Goiás, respectively. These states have the highest number of slaughters in the country. Therefore, the company in question has negotiations with suppliers from these locations, who deliver the raw material (beef) to its plant in the state of Ceará, so that the production of sausages can be carried out.

The receipt of this cargo is carried out by road, at the company's Distribution Center, located in the same city, but in another strategic location.

The company's quality control has the function of collecting a sample of the incoming load (beginning, middle and end of the load) for sensory analysis, presence of hair, nerves, bones, foreign objects, etc. Thus, the conditions of this cargo are recorded in a form and when non-compliant, an RNC (Non-Conformity Report) is opened that is sent to the supplier, who has 10 days to return with a corrective action for the problem. When the degree of non-compliance reaches the risk of food safety or that impairs the productivity of the line, the cargo is blocked and returned to the company's Supply sector is requested.

This is how the flow of receipt of the sausage industry occurs, which will be the focus of this work, which aims to launch improvements through the implementation of the MASP tool, bringing greater productivity to the company and consequently greater food safety to the consumer.

PROCEDURE CARRIED OUT

The first stage of observation and data collection took place over a period of 5 months (February to June 2019), by company employees, both operational and leadership and management, through verification sheets. The tools of Brainstorming, Pareto Diagram and Ishikawa Diagram were used to analyze the data collected, and finally to know the causes and act on them, showing to the company's senior management, the best decision and path to be followed, according to the facts.

The data collection work began through a meeting with employees from the company's shipping/receiving, quality and production sectors. It was agreed that in each sector there would be a person responsible for recording on the verification sheets the data necessary for analysis, which would be the main problems faced during the receipt of the raw material, the analysis by quality control and the use in the production line.

Data were collected daily and compiled in the Problem Survey Worksheet, and, at the end of the 5th month, the Pareto Diagram tool was used, in which the most frequent occurrences in the time in which the process was observed were known. With the application of brainstorming with the employees involved, leaders and managers, it is possible to know the possible causes for the most relevant problems accused in the Pareto Chart.

With the results of the brainstorming in hand, the Ishikawa Diagram tool was applied to map the main causes pointed out.

A specific standard procedure was made for the operation, along with an action plan, including a new standard flow. This procedure was presented to all those involved, who underwent training to work with the new methods.

The follow-up was carried out for another 3 months (July to September 2019), and a new data survey on check sheets, with the data collected, the Pareto Chart was applied to, through the graph, make a comparison with the first analysis and be able to visualize the improvements achieved.

## DEVELOPMENT

QUALITY TOOLS

Quality tools are techniques that can be used in order to define, measure, analyze and propose solutions to problems that are eventually found and interfere with the good performance of work processes. In Kaoru Ishikawa's opinion, 95% of quality problems can be solved with the so-called "7 basic

quality tools", and it is important to have knowledge of these that should be known and routinely applied by everyone.

The seven tools of quality are basically as follows:

- Verification Sheets;
- Diagrama de Ishikawa;
- Pareto Chart;
- Histogram;
- Flow chart;
- Scatter Plot;
- Control Chart.

VERIFICATION SHEET

Verification sheets are forms that can be in the form of a table or spreadsheet, as long as you can collect and organize the data during the registration season, which facilitates the analysis of these at a later stage, allowing immediate information of the situation, helping to reduce errors.

The information collected should translate the concrete facts and guide and forward the subsequent discussion of the improvement project actions that will be implemented. This shows the importance of planning very well the type of form that should be used to collect the data, this should be specific and be shaped to facilitate the quick and accurate collection of those who are acting in this function. One of the most widely used and highly effective forms is the checklist, which can be edited according to the activity that will be performed.

ISHIKAWA DIAGRAM (FISHBONE)

The Cause and Effect Diagram was developed to represent the relationship between the effect and all possible causes that can contribute to that effect. Most of the time you know exactly the effects, but you have no idea what is causing it, so the Diagram that, because it has a shape that resembles a fish skeleton, is also called Fishbone, provides a model conducive to the actor thinking about several sources of causes for a single problem and thus being able to act on specific corrective actions, No loss of time or focus.

To prepare the diagram, it is necessary to create macro categories in order to try to find the causes of a problem related to each defined category. For example, at times managers may think that the cause of a problem in the production line is the production machinery. The macro category is machinery, the sub-

causes would be the productive capacity of the machines; the machines are old and among other elements (ALONÇO, 2018).

PARETO CHART

The purpose of the Pareto Chart is to show the importance of all conditions in order to: choose the starting point for solving the problem; Identify the root cause of the problem and monitor success. Vilfredo Pareto was an Italian economist who discovered that wealth was not evenly distributed. He formulated that approximately 20% of the people held 80% of the wealth, creating a condition of unequal distribution. Pareto charts can be used to identify the most important problem through the use of different measurement criteria, such as frequency or cost (MAGALHÃES, 2015).

The 80/20 ratio (Pareto chart) is great for:

- Identify problems;
- Verify the main causes of non-conformities;
- Ascertain whether work efforts are being applied in the right direction.

HISTOGRAM

Conceived in 1833 by the French lawyer and statistician A.M. Guerry, during a study of criminal occurrences, it is based on the idea that each phenomenon has its own way of varying. Then, one can visualize this variation, getting a lot of useful information about the phenomenon.

It is a graphical tool that assists in the verification of data frequency that aims to identify how a given sample is distributed. Also known as the Frequency Distribution Chart, the histogram is represented by a bar graph and its visualization helps in the understanding of cases, such as:

- Quantity of non-conforming products;
- Dispersion of the measurements of a given product;
- Among others.

In addition, this quality tool fits perfectly in the face of quantitative variables that require some type of measurement (ALONÇO, 2018). Example:

- Weight;
- Width;
- Length;
- Temperature;
- Volume;

- Time.

FLOWCHART

The purpose of the Flowchart is to identify the best path that is the most ideal for a product or service in order to identify deviations. It is a sequential illustration of all the steps in a process, showing how each step is related. It uses easily recognized and standardized symbols to denote the different types of operations in a process.

The process flowchart can be useful when designing the processes and visually indicate:

- The beginning and end of a process;
- The activities of a process;
- The decision points;
- The required documents;
- The continuous flow of information, etc.

This tool helps a lot for those who can visualize the deviations by looking at the path that the entire process takes, which helps to see the big picture and not forget any step that can help improve the process.

SCATTER PLOT

A Scatter Plot (also known as a Scatter Plot, Correlation Plot, or XY Plot), is a graphical representation of the possible relationship between two variables and, in this way, graphically shows the numerical data pairs and their relationship (FORLOGIC, 2016).

Generally, the relationship comes from a variable that is independent and another variable that is dependent on the first, i.e., the independent variable is the cause that causes the effect and the dependent variable is the effect (the consequence generated by the cause).

CONTROL CHART

The Control Chart is considered a trend chart, which shows how a particular indicator varies over time, with control limits. The purpose of these control limits is to give the team a sense of the natural variability of the process, that is, how much it should normally vary.

In other words, the Control Chart is able to show if the process is stable or if there is something abnormal with it. These "abnormalities" are very useful in process improvement, as they tell you exactly when to study the process in order to learn more about it.

The ability of things to vary and form a typical pattern of variation is one of the most fundamental laws of nature: everything varies, it is impossible to predict an individual outcome, yet a group of outcomes, coming from the same set of causes, tends to be predictable, following a certain distribution. When a set of causes is disturbed by external causes, the distribution of results changes.

BRAINSTORMING

It is a technique already well known in the business world, also known as "brainstorming", used in order to generate many ideas in a short period of time.

Its concept was originally proposed by the American Alex Faickney Osborn, who in 1939 created the technique (but only published it in 1953) after realizing that his employees were very bad at creating creative advertising campaigns for their clients. Thus, he began using group sessions to collect lists of ideas spontaneously suggested by participants (PRADA, 2018).

When brainstorming becomes a habit, it becomes easier for employees (and leaders themselves) to anticipate market trends and attack problems, using collaboration and creativity.

As it promotes constant interaction and the appreciation of all insights, the process encourages teamwork. Thus, a company that invests in this procedure will have a more appropriate work environment.

Other than that, employees involved in brainstorming tend to have increased levels of effectiveness. This happens due to the appreciation they feel when being involved in a dynamic that can decide the direction of the business. The trust generated by this phenomenon is essential to optimize internal communication.

**MASP**

According to Carpenetti (2012), MASP is a more detailed version based on the PDCA cycle. The method conceived in an orderly way, composed of several steps, is intended to choose a problem to solve a certain situation, after segmenting the analysis of causes, determining and planning a set of actions, verifying the result of the solution and disseminating the learning resulting from its application.

The tool also aims to make the environment more organized and easier to follow the process flows, making it easier for the organization to apply continuous improvement automatically.

According to Cerqueira (1995), the MASP development process only happens when it has 4 essential elements, namely: group execution; structured tool; quality tools; collection of reliable data and information.

MASP is essential for the elaboration of corrective action plans where organizations need to identify the impact of problems related to risks, costs and benefits (CERQUEIRA, 1995).

THE PHASES OF MASP

MASP is a method that is based on eight steps, with the purpose of identifying, analyzing and solving problems, so that the problem does not persist, using the PDCA methodology and the various quality tools (SANTOS, 2005). They are described below:

**Identification of the problem**

The first step is to identify the problem based on a history of events, understanding its risks, gains, and losses.

It is simple, but it must be done in a clear and judicious way, as it is a very important step to optimize the time to solve problems.

This stage also involves choosing the problem to be solved (based on the history and analysis of gains and losses), the formation of the team and delegation of responsibilities to each one, and finally, the definition of improvement goals.

**Note**

The second stage is observation. It consists of a survey of the characteristics of the problem based on the observation of the site and consistent data collection.

The problem must be observed from several points of view, such as the way in which the results vary, how they vary according to the location, according to the individual or team, or with what periodicity.

**Analysis**

At this stage, hypotheses are raised to understand the problem. The root causes of problems must be analyzed in a clear and "scientific" manner, using tools, information, facts, and data analysis for an objective conclusion.

It is one of the most important steps in the process, as it starts from possible influential causes to the identification of the fundamental cause, on which consistency tests will be applied.

**Action plan**

Once the root cause or causes have been discovered and proven, an action plan must be established to eliminate them.

It should be verified whether the actions are having an effect on them, how effective they are, what goals will be achieved, and what the control rates are. In other words, it is time to define and document the strategy to be followed.

**Action**

The next step is the time to put the action plan into practice. It starts with the communication of the plan with the people involved, goes through the execution and training of the executors, and finally, the monitoring of the actions to verify that their execution was done correctly and as planned.

**Verification of the action**

After the implementation of the action plan, it is time to quantitatively and qualitatively verify the effectiveness of the actions and their impact on the results.

The before and after the implementation of the plan should be compared, the positive and negative effects listed, and if the effects are negative, whether the action was implemented as planned.

**Standardization**

If the actions taken have been effective and have produced effective results, they can become new working methods. Standardization must be made to record the effective measures and also prevent failures from perpetuating.

It must be ensured that the new system is transmitted to all areas and teams involved and that the use is accompanied by measurement systems.

**Conclusion or finalization**

Basically, the goal of this step is to review the entire problem-solving process and plan future work by applying the lessons learned to new opportunities for improvement.

**PRESENTATION AND DISCUSSION OF RESULTS**

The following topics present the steps implemented in the MASP tool in order to have the best improvement proposal for the problems encountered.

IDENTIFICATION OF THE PROBLEM

According to the leaders and employees involved in the process of receiving raw materials from the sausage industry, several problems affect productivity, quality and even present risks of contamination and food safety for the final consumer, due to misaligned processes, generating a product with no quality and a reduced shelf life.

Problems pointed out, such as, meats with a high amount of bones and above the standard, making it difficult to pass through the meat grinder and delaying production, meats that arrive first are used before those that were already stored in stock, finding foreign objects during use, being the blocking of the load

by quality control in the middle of the process, Meats that arrive without prior scheduling, due to some commercial negotiation and have to be used as a priority, sometimes due to temperatures at the limit or critical dates (with less than 30 days to expiration), are more frequent in the process and cause complaints and even the return of products without standard, non-compliant or unable to reach the end of their shelf life.

NOTE

In order to be able to identify and quantify these various problems, a data survey was carried out, with the help of verification sheets, in which a person responsible for each sector pointed out every day the problems that interfered in the process and their frequency.

During the period of 5 months, those responsible in each sector observed the problems that occurred, and at each intervention in the process, records were made. Those responsible did not intervene in the current process and only observed and made the necessary notes, according to a training, in which everyone was trained to be able to collect such data.

DATA ANALYSIS

The collected data were compiled in Table 1 and, thus, a descending order was made to organize the most frequent problems into the lowest ones. Thus, the Pareto Diagram was applied to identify the most frequent problems with real significance for products with no quality.

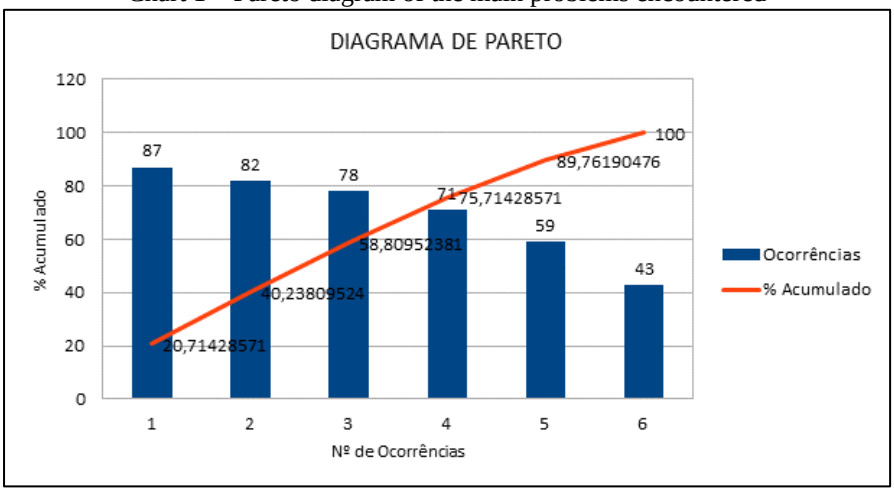
Table 1 – Problem Survey Worksheet

| **PERÍODO DE ANÁLISE: FEVEREIRO – JUNHO 2019** | | | |
|---|---|---|---|
| **PRINCIPAIS OCORRÊNCIAS:** | **Ocorrências** | **% Ocorrências** | **% Acumulado** |
| QUANTIDADE DE OSSOS ELEVADA | 87 | 20,71 | 20,71 |
| CARGA BLOQUEADA AO RECEBER | 82 | 19,52 | 40,24 |
| TEMPO DA ANÁLISE DE QUALIDADE | 78 | 18,57 | 58,81 |
| FALHA NO PEPS | 71 | 16,90 | 75,71 |
| PRESENÇA DE CORPOS ESTRANHOS NA MP | 59 | 14,05 | 89,76 |
| RECEBIMENTO "DE ÚLTIMA HORA" - NEGOCIADO COM O COMERCIAL | 43 | 10,24 | 100,00 |
| **TOTAL** | **420** | | |

Source: Company data (2019)

Analyzing Graph 1, it was noticed that the highest occurrences during the 5 months of observation and records were: 1. High amount of bones and 2. Load Lock on Receiving.

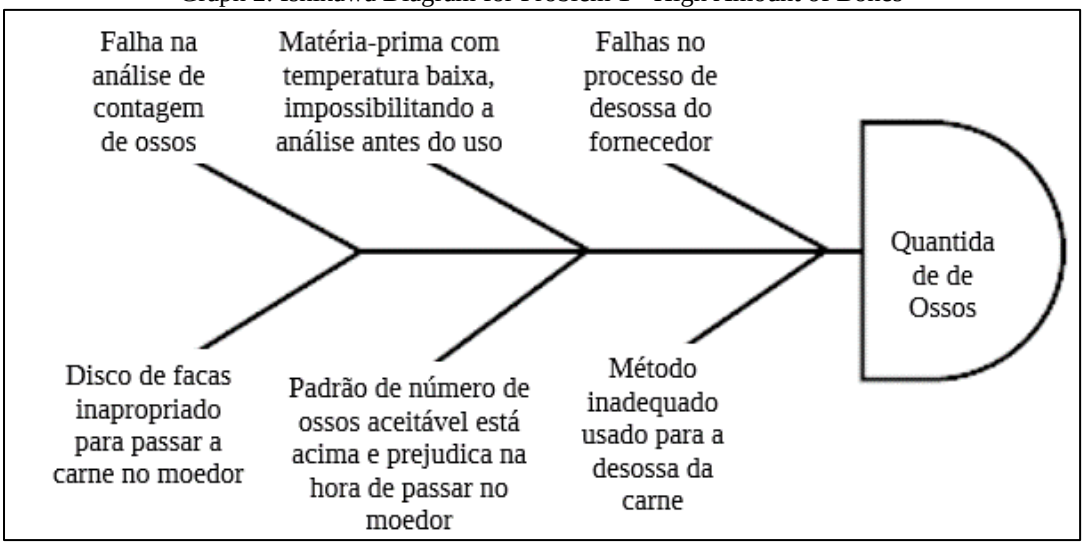
Chart 1 – Pareto diagram of the main problems encountered




Source: Company Data (2019)

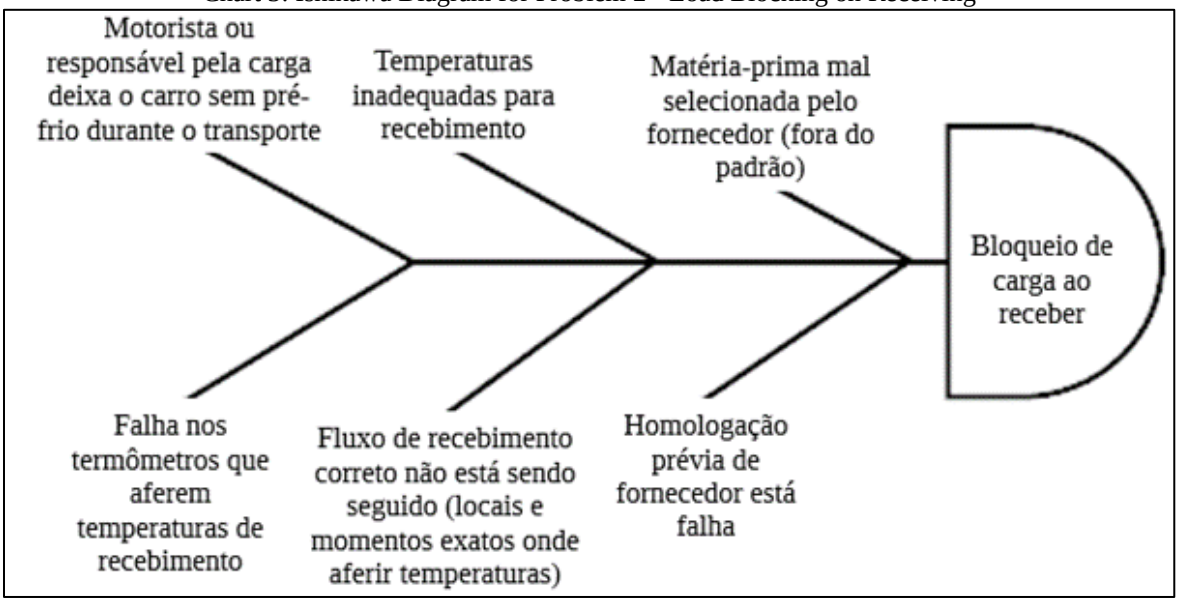
With this analysis in hand, a brainstorming was carried out with production leaders and managers to be able to identify the main causes of these two most relevant problems. From this, Graphs 2 and 3 were elaborated through the Ishikawa Diagram, for problem 1 - High Amount of Bones and for problem 2 - Load Blocking when Receiving, respectively, to make the necessary analyses and create the action plan in sequence.

Graph 2: Ishikawa Diagram for Problem 1 - High Amount of Bones




Source: Company Data (2019)

Chart 3: Ishikawa Diagram for Problem 2 - Load Blocking on Receiving




Source: Company Data (2019)

ACTION PLAN

With the main causes defined in common agreement with the leaders, managers and operational, an Action Plan was then created with the strategies to combat these causes.

In the plan, strategies were outlined that could optimize or even avoid the causes of the main problems pointed out by the group that participated in the brainstorming.

In this phase, the deadlines that should be met and the main responsible for the actions were implemented, to facilitate the progress and monitoring of the project during the verification period.

It was also discussed about the resources that would be necessary for the fulfillment of the actions in their entirety, and it was decided only to purchase new discs for the grinding equipment, as the old ones were already worn out, impairing the passage of the raw material.

ACTION

At this stage, the Action Plan was put into practice, along with the continuation of the completion of the Verification Sheet to be able to validate the correction and combat of the main causes pointed out.

Chart 1 shows how the process was assembled and completed.

Table 1: Action Plan – Project to Improve the Receipt of Raw Materials

| PLANO DE AÇÃO | | | | | | Data do Plano: | 28/06/2019 |
|---|---|---|---|---|---|---|---|
| PROJETO DE MELHORIA NO RECEBIMENTO DE MATÉRIAS PRIMAS | | | | | | Rev: | 00 |
| | | | | | | Responsável: | Valkiele Mota |
| Data da última atualização do plano: 30/08/2019 | | | | | | | |
| ATIVIDADE | RECURSO NECESSÁRIO | REPONSÁVEL ATIVIDADE | DATA INÍCIO | PRAZO | DATA TÉRMINO | STATUS | OBSERVAÇÕES |
| Treinamento de Análises de MP | - | Supervisora de Qualidade | 02/07/2019 | 7 dias | 05/07/2019 | CONCLUÍDO | Treinamento em contagem de ossos e análise sensorial das carnes, com todos os auxiliares da qualidade; |
| Revisão e Manutenção Preventiva nos equipamentos do setor "masseira": moedor e discos; | Discos novos | Gerente de Manutenção | 06/07/2019 | 30 dias | 12/08/2019 | CONCLUÍDO | Trocado os discos antigos com desgastes; |
| Atualização da documentação dos fornecedores de MP para regularização; | - | Supervisora de Qualidade | 01/07/2019 | 30 dias | 02/08/2019 | CONCLUÍDO | Análise de laudos microbiológicos e das Especificações Técnicas; |
| Estabelecimento de prazos para envio de amostras para análises do CD e para análises da MP na indústria; | - | Supervisora de Qualidade | 01/07/2019 | 10 dias | 08/07/2019 | CONCLUÍDO | Prazo de até 72h para serem enviadas as amostras do CD e prazo de 24h para serem analisadas na indústria; |
| Criação de ordem de prioridade para as análises de MP que necessitam ser usadas imediatamente; | - | Supervisora de Qualidade | 02/07/2019 | imediato | 02/07/2019 | CONCLUÍDO | MP's que necessitam de uso imediato, entram na lista de prioridades para serem analisadas e liberadas; |
| Criação e implantação de um procedimento padrão para recebimento de MP; | - | Supervisora de Qualidade | 03/07/2019 | 30 dias | 06/08/2019 | EM ANDAMENTO | POP com todo o fluxo que deve ser obedecido para melhoria contínua; |

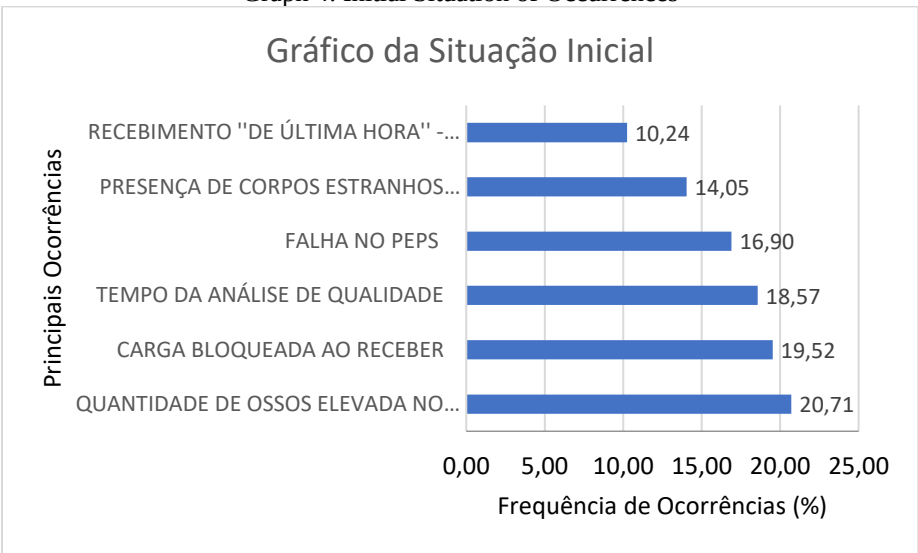
*MP= Matéria-prima

Source: Company data (2019)

## VERIFICATION

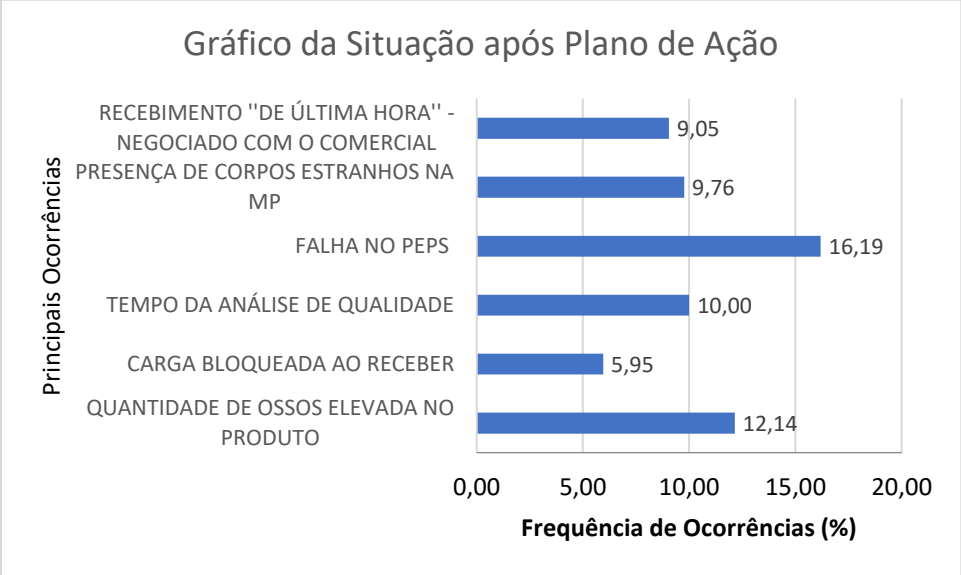
At the end of the deadline stipulated to complete the project (September 2019), the records were collected in Verification Sheets that the operative was filling out and the data was compiled in a table for better visualization. With the data in hand, it is possible to create the two graphs for comparison, Graph 4 of the Initial Situation, with the results of the initial situation of the project (initial 5 months of follow-up), was compared with Graph 5, of Situation after Action Plan, with the results after the adjustments and implementation of corrective actions.

Graph 4: Initial Situation of Occurrences




Source: Company Data (2019)

Graph 5: Final Situation of Occurrences (after Action Plan)




Source: Company Data (2019)

Analyzing it, it can be seen that in the two main problems, "Load blocked when receiving" and "High amount of bones in the product", there was a reduction, respectively, of more than 60% and 40%, which was satisfactory and sufficient for the improvement to be notorious in these aspects.

Other points also had reductions in occurrences during the period, and it is believed that with the organization of the flow, training of the teams and greater demand in relation to the standard and compliance of the raw materials with the supplier and the company's supply sector, all problems were alleviated, as the old process was improved in its entirety.

## STANDARDIZATION

After the science and analysis of the collected data, the standard procedure for the Receipt of Raw Materials and their Analysis was created. This procedure describes the steps for the approval of suppliers, such as the receipt of raw materials (unloading, temperature analysis, storage and analysis by quality control), corrective actions for non-conformities in the process (return of cargo, conditional or partial use), as well as corrective actions.

Forms and spreadsheets were created to fill out data collection and training was carried out with all those involved (production and quality operational, supply sector, leaders and managers) so that the new flow and process is followed by everyone in agreement, so that continuous improvement is always active.

## FINALIZATION

At the end of the study after the eight steps of the method were completed, it was possible to analyze that the use of the MASP method was extremely important in the results achieved. Obtaining a

satisfactory reduction of more than 60% of the most relevant occurrence, which showed improvement in the operational process, proving to employees, leaders and managers that it is possible with just an organization of the flow and new methods implemented, greater productivity and, consequently, better working conditions.

The continuation of the project could take place through the analysis by Pareto Diagram again of the data of the occurrences after the Action Plan, to create new strategies for the problems that still continue with a major occurrence and harming the process, or even to be able to visualize new problems that may happen, but this is not the case at this time. The intention was to take a first step to solve problems in the receipt of raw materials and to implement a procedure to standardize flows and processes. But, continuous improvement can, and should, occur at all times, aiming to improve the flow and avoid problems.

**FINAL THOUGHTS**

With this work it was possible to obtain several positive learnings during its application, such as the possibility of obtaining productivity and process improvement just by reorganizing the steps of a certain flow, without many initial costs for the company, because it is of paramount importance that a process flow is coherent with the needs and current reality of the organization. so that it can flow efficiently meeting all the demands of all sectors involved.

The importance of the involvement and training of all personnel involved in the operation and leadership was also quite evident, as communication and teamwork make everything interconnected and that nothing goes unnoticed within the process. With this, people were engaged and able to include in their routine the pointing out and recording of the problems that occurred during the estimated time and thus discussed their main causes.

With the use of quality tools and the application of MASP, several problems were raised, planning was defined and objectives and corrective actions were defined based on the problems to be solved, represented by the "high amount of bones of the raw material" and "return upon receipt".

Thus, it can be affirmed that the objectives of the present research were achieved, due to the significant reduction of the main production problems in the process of receiving raw materials and an organization of the process as a whole, due to the standardization of flows.

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