

# Implementation of the 5S methodology and its impact on the productivity of bread production following the PDCA cycle

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*Keywords-- productivity, 5S, PDCA, MYPE, waste elimination.*

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## I. INTRODUCTION

In Peru, labor and economic development are two factors that every country strives for in pursuit of an improved quality of life for its residents. Based on this, companies have become the economic engines of each nation. Among these, small and medium-sized enterprises (SMEs) stand out, collectively forming a fundamental pillar in Latin America's economic structure [1]. Additionally, the number of jobs generated by such enterprises has yielded a significant outcome, with micro and small businesses alone accounting for 47% of jobs in the region [2]. As a result, the current work is aimed at enhancing the productivity of an SME in the manufacturing sector, which faces issues of order and organization within the company. These issues lead to various challenges, such as the well-known bottlenecks in the bread-making process, which, in turn, hinder productivity and render the company inefficient.

On the other hand, it is estimated that there are around 10,000 bakeries in Peru, with the highest concentration in the capital city of Lima, exceeding other regions of the country by 43%. This substantial competition underscores the importance for bakeries to provide customers with products of superior quality at the best price. However, achieving this objective within the studied company would be unattainable without the

application of continuous improvement techniques that rectify processes plagued by flaws or economic losses. Building on the aforementioned, this work focuses on boosting the productivity of a bakery through the implementation of the Japanese 5S tool. The objective is to eliminate all unnecessary processes and manage the bread-making process in a much more productive manner. Furthermore, the implementation of this tool will adhere to the four phases of the continuous improvement cycle, also known as the Deming cycle[23].

Finally, the motivation behind this research is to establish a record and a guiding model for other companies aiming to enhance their processes. In Peru, micro and small enterprises (SMEs) are not accustomed to following the continuous improvement process in their operations [21], let alone applying Lean thinking during their activities.

## II. STATE OF THE ART

### A. Lean Thinking

The foundation of Lean thinking lies in continuously measuring and gathering data to eliminate or rectify activities or processes that do not contribute value to the final product, while enhancing those that do add value. All of this is centered around the principle of continuous improvement. According to the book "Lean Thinking: Banish Waste and Create Wealth in Your Corporation," written by Womack and Jones [3], the authors approached the concept of Lean from a broader perspective, extending the core idea from a functional level to the realm of business. The authors refer to Lean thinking as a way to define value, organize actions that create value in an improved sequence, and execute these activities seamlessly whenever requested, steadily enhancing their effectiveness.

Five key principles of Lean Thinking have been devised to tackle the diverse challenges arising within and between business units due to variations in corporate culture and management thought processes.

These key principles of Lean thinking are as follows:

- Define value from the customer's perspective: Leads the organization to assess and reconsider who its real customers are and what those customers value [4].

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- Identify value streams: Firstly, a view focused on the value-adding process. Secondly, it encompasses the specific activities involved in adding value to the creation of a specific product or service of the organization [5].
- Create and facilitate the flow of value: Flow within the remaining value-added processes after eliminating obvious waste in the value stream, aiming to reduce production costs, improve workstation efficiency, and enhance machine utilization rates rather than product value stream [6].
- Implement pull-based production: This is probably the most counterintuitive aspect of Lean thinking. For this reason, pull ensures a continuous flow in the production process by linking actual customer orders with the production rate [7].
- Strive for continuous perfection: Aiming for perfection continually ingrains the Lean believers with the notion that waste elimination in a value stream is an ongoing process, not a one-time event, while delivering exactly what a customer requested, not merely attempting slightly better than competitors [8].

The aim of these key principles is to establish flawless value streams by continuously identifying and eliminating waste, while focusing on the activities that create value [9].

### B. Lean 5S Tool

5S is an organized approach to ensuring optimal productivity, safety, and quality in any organization. The primary and most crucial step on the roadmap of lean manufacturing implementation is the 5S method, which aids in addressing and reducing waste associated within or between an organization's processes. Furthermore, it contributes to making the workplace efficient, enhancing safety, and also serves as a foundation for Total Productive Maintenance [10]. 5S is a cleaning tool that systematically promotes cleaner manufacturing. It assists in cleaning up the entire process by reducing waste. By planning, managing, and regulating the production process, 5S streamlines the process, saves operational space, capital, and time, and yields goods with fewer defects. It establishes a disciplined, clean, and well-organized work environment [11,20].

#### Phases of 5S Implementation:

Sort (Seiri), aims to eliminate unnecessary items that hold no value and are easy to discard in the workplace. The system of maintaining each material in its appropriate place within the company is referred to as "Sorting." Unnecessary, excess, or rarely used materials and equipment in the workplace lead to clutter and reduced work efficiency. Set in Order (Seiton), involves selecting disorganized elements and placing them

where they fit best, thereby preventing congestion. The fundamental strategy for implementing this step is to employ a visual approach as much as possible, aiming to avoid time losses during searching and trial and error.

Cleaning (Seiso), once unnecessary items have been discarded, and necessary items have been sorted and set in order, the next step is to clean the workspace. The purpose of this stage is to eliminate and replenish the station, as well as remove the root cause of waste, dirt, and damages. This step should involve all employees in how they will clean and how often they should do so. Standardizing (Seiketsu), it is crucial to maintain the area after organizing and cleaning a production area. That's why the organization develops standardized procedures, rules, and expectations for the continuous maintenance of activity across all areas. Standardization involves creating visual guidelines to keep the workspace organized and clean. Standards should be highly communicative, descriptive, and understandable.

Sustaining (Shitsuke), this aspect is also essential to maintain the continuity of daily routines. At this level, self-discipline in one's daily work must be upheld consistently. The ability to maintain discipline is crucial after the successful adoption of the 5S method. The four phases of 5S yield potent, visible, and easily quantifiable effects [12].

TABLE I  
APPROACH 5S

	Japanese	English	Meanings
S1	Seiri	sort	Remove unused items from your workplace. This step will also help to identify what is missing from your workplace
S2	Seiton	set	Organize everything needed in the proper order for easier work. This step is based on finding efficient and effective storage
S3	Seiso	shine	Maintain a high standard of cleanliness of the workplace, tools and equipment. This step will create ownership of infrastructure equipment and tools
S4	Seiketsu	Standardize	Maintain an environment where S1 to S3 are implemented in the same manner throughout the organization
S5	Shitsuke	Sustain	Maintain S1-S4 through discipline, commitment and empowerment. This step focuses on defining a new mindset and standard in the workplace

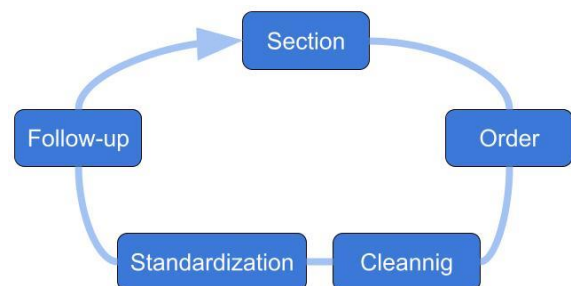


Figure 1. The 5S Foundation for the Culture of Continuous Improvement

*C. PDCA cycle*

The Deming cycle, continuous improvement cycle or simply PDCA cycle, for its acronym in English plan, do, check, act, is a methodology that allows, as its name says, to continuously improve a process or processes within a company. In other words, before any plan that you want to execute as part of a continuous improvement project within a company, it must be carried out following four essential steps to obtain beneficial results that make the execution of the project a success.

These four steps or stages are as follows:

**Planning**

This step consists of analyzing everything related to the problem that is bringing negative consequences for the company and once this is clear, making an improvement plan in which all the tools, schedule, budget, scope, limits and everything necessary are described. so that the execution of the plan achieves the objectives set at the beginning.

**Make or execute**

In this step, the plan from the previous stage is executed following all the instructions and sequence of activities that were stipulated in the plan, but in general, test executions or previous pilot tests are carried out before carrying it out on a large scale.

**Verify**

In this stage of the continuous improvement cycle, the results of the execution of the plan are analyzed, the verification of said results can be done at the general level of the improvement plan or by activities applying different tools such as Pareto diagrams, control charts, KPI' yes, etc. Once these results are found, we proceed to compare them with the expected results that were in the planning stage, if there are any discrepancies, we proceed to the last stage.

**Act or Adjust**

Finally, at this stage, action is taken based on the results obtained in the pilot test, making some adjustments and improvements to the plan that allow the gaps found in the verification to be closed in this way. Consequently, if once these adjustments to the improvement plan have been made, the expected results are obtained, then the improvement plan is standardized, all the procedures are compiled and subsequently disseminated to all members of the company so that they can be execute on a large scale thus generating recommendations for future continuous improvement plans. If, on the contrary, the results continue to be non-conforming with respect to those expected, even having applied the necessary adjustments, then it returns to the planning stage, thus closing the cycle and starting again, thus creating a cycle of continuous improvement.

*D. Standardization*

It is a dynamic process by which we do and document our work following standards, methods and principles established

by our organization; It shows us that everyone does the job in the same way, respecting the established safety, quality and productivity requirements. These processes take into account the people, materials, machines and other resources used.

The main benefit of standardization is that it allows improvements in processes which generate positive impacts in a company. In other words, if it is not established how people should work from the beginning of a process, then something cannot be improved if it is not based on something documented or standardized. One of the reasons why standardization is important in the business world is because it allows companies to be competitive and grow in a certain market, standing out for their quality in terms of their core business. It is important to emphasize that if there is no standard of work in a certain company then the chances that the staff will obtain different results will be very high since they will adjust, operate and monitor differently. On the other hand, standardizing a process first generates the transfer of knowledge among the staff, since assuming there are new workers, then it will be easier for them to train and acquire their own knowledge much faster, reducing the chances of making mistakes thanks to the documented process. . Finally, the standardization of processes will favor the continuous flow of production since, thanks to its documentation, it will allow eliminating unnecessary activities and eliminating waste produced by carrying out erroneous activities, which could affect the final product and economic losses for the company[13,22].

General steps to implement it:

- a. Determine the required takt time.
- b. Record all steps of the process.
- c. Document standardized tasks.
- d. Sustain and improve through audits.

TABLE II  
BENEFITS OF STANDARDIZATION

Advantages	Disadvantages
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<ul style="list-style-type: none"> <li>• Reduces production costs.</li> <li>• Facilitates technological advances</li> <li>• Provides recurring results</li> <li>• Development of a baseline, with this the quality can be managed and measured.</li> <li>• Detection of problems and variation</li> <li>• Allows the transfer of knowledge.</li> <li>• Elimination of waste.</li> <li>• Productivity</li> </ul>	<ul style="list-style-type: none"> <li>• High costs when incorporating systems, machinery, procedures, materials, etc.</li> <li>• Impediment in experimentation</li> <li>• Adaptation and Staff training.</li> </ul>
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### III. CONTRIBUTION

In the general solution model (Figure 2), the main problem is reflected in the upper part in red, which is the low profit at Thomas's bakery. From there the two root causes emerge, which are: Inefficient planning processes and the lack of standardization of processes and indicators. Based on these two root causes found in the investigation, the inputs that will be needed to deal with this problem were designed.

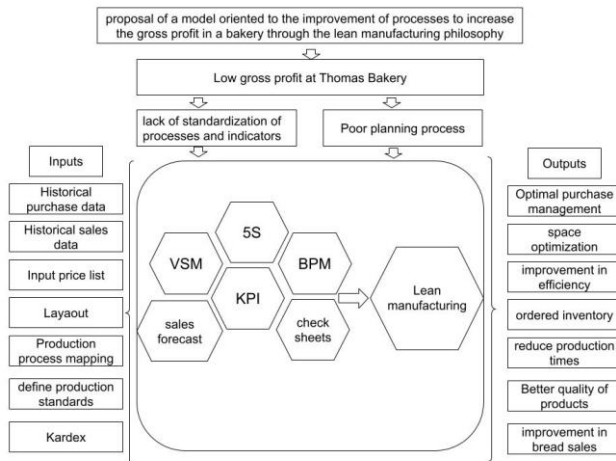


Figure 2: General Model of the Solution Proposal

You will need to know the historical purchase and sale data, the price list of the inputs used in the bread production process, etc. Then in the middle of the model are the different tools that will be applied, among them are the 5S, it will be implemented in all production processes from the process of weighing the raw material, which will be the beginning, to the last process, which is the sale of the product. finished. With all this, we want to promote a culture of cleanliness, discipline and continuous improvement to work more efficiently. Red cards will be implemented for Seiri, cleaning manuals in Seiton and audit sheets to fill out monthly in Shitsuke.

#### STAGE: EXECUTION

In the first place, one of the Lean Manufacturing tools such as the 5S will be used to organize the workspace, reduce the number of errors in the production of bread and improve productivity in this process.

Therefore, each S applied to the workspace will be analyzed and a record of the application of this tool will be left with the respective documents to be filled out by the bakery workers.

- Seiri (Classification)

The classification process will follow the following procedure, to identify and classify the necessary objects in order to organize them later. Then, the objects that are damaged will be repaired if they are useful to be organized and if they are unnecessary they will be separated to be discarded later, in addition, if the surplus objects will be discarded or sold.

For the process of classifying the objects within the production of the bakery, the red cards (Figure 3) will be used. These cards have the purpose of classifying and separating the products that do not contribute to the daily work of the production of bread.

Figure 3: Red Card for the Classification of Unnecessary Items – SEIRI

Once the articles with the red cards have been classified, the results will be recorded in Excel. This table will allow the entry of the name of all the items, not only the unnecessary ones, but also the number of items, whether they will be useful

or not, and finally the destination that will have to be applied for a correct application of the first S.

TABLE III  
APPLICATION OF SEIRI IN THE PRODUCTION PROCESS.

classification		location	production area	date	23/05/2022
		manager name			
N°	Article	Quantity	object type	they are useful?	destination
1					
2					

- Seiton (Order)

At this point, the equipment, materials, tools and all the items chosen in the previous classification stage will be divided into six types of frequency of use and each of these types will have a measure of action which will be the position of the item according to its frequency of use. That is to say, if the article belongs to a type of low frequency of use, then it will correspond to a site that is further away from the worker, on the contrary, if the frequency of use is high, then the article will be placed closer to the collaborator. Therefore, the results of the articles will be recorded in an Excel table. This format will be filled out by the production area workers once a month and is divided into five fields. These records are so that all the steps of the 5S application are documented and that it remains as knowledge for the company in addition to standardizing its processes.

TABLE IV  
APPLICATION OF SEITON IN THE PRODUCTION PROCESS

Order		location	production area	date	23/05/2022
		manager name			
N°	Article	Quantity	necessary (yes or no)	frequency of use	location
1					
2					

- Seiso (Cleaning)

The head of the production area will proceed to fill out a monthly cleaning manual created in Excel for the bakery. In this table there are three main fields such as the responsible, task name. In addition, it will indicate what cleaning equipment will be needed to carry out the tasks. Finally, the days that each activity will be carried out within the thirty days of the month will be painted.

Cleaning manual				Location	design and development office	Date	20/07/2022																											
				manager name		Version	1																											
N°	manager	task description	cleaning equipment	Days																														
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Figure 4: Cleaning Manual for the Production and Sales Area

- Seiketsu (Standardization)

Simple and visible normals are established for all workers since it will consist of easily distinguishing and differentiating one normal situation from another. The norms or visual signals that will be carried out are the following:

- Paint or mark the floor to delimit a single space for some types of items.
- Photograph before and after the application of the 5S to place the photos (Figure 5) in strategic places in plain sight of all the workers and that these serve as a visual norm of how the work space should be preserved.
- Place the technical data sheets for the preparation of bread and the cleaning manual in sight
- Have marked everything that is necessary for the production process.



Figure 5: Visual Standards for Seiketsu Application

- Shitsuke (Discipline)

The supervisor of the production area will have to fill out an internal audit form throughout the bakery to corroborate the results obtained from the previous S's. This step is extremely important since it will be seen if the established objectives were achieved or if, on the contrary, it was far or close to achieving the objectives. Also, the score will be placed from 1 to 5 according to the level of compliance that each criterion had, if a score of 5 was not obtained, the necessary corrective actions will be placed, the person responsible for compliance

with said corrective actions and the term what do you have to do it.

#### IV. VALIDATION

This chapter will show the before and after of the production process of the company that has gone through different stages of the implementation of the lean manufacturing tool.

a) Taking time by processes in the production area before the implementation of the 5S. The times of the different processes involved in the production of the best-selling bread in the bakery are taken. This product is French bread and it is prepared during the first production shift, which is from 10:00 p.m. – 07:00 a.m., for direct sale, although it could also be prepared in the second production shift, which is from 07:00 a.m. – 17:00 pm, if there are wholesale orders from other businesses.

TABLE V  
TIMES BY PROCESSES OF THE ELABORATION OF FRENCH BREAD.

Process	Average time (minutes)
Weigh the supplies	5.34
Initial mixing of inputs	9.18
Knead the dough	8.2
refine the dough	5.35
stretch dough	4.23
Divide the dough into even pieces	3.15
Shape the dough	3.28
fermented from the dough	180
heat oven	40
dough baking	12.5
bread chilled	15

b) Implementation of the 5S Application Process in the Bread Production Process. Through the work schedule, the implementation of the 5S was carried out within the production area of the bakery, to improve its efficiency and productivity of the different processes involved in the production of bread. In this way, it is expected to contribute to the reduction of the number one root cause. Next, the implementation of the different stages of the 5S will be presented.

#### Seiri Implementation

Classification of objects and supplies: In the classification of all the objects found in the production area, red cards were used to easily identify unnecessary objects within the area and those that did not have the cards would be considered as necessary objects for later. be organized.



Figure 6: Photos of Objects With Cards



Figure 7: Photo of Necessary Objects Organized

Finally, the entire procedure is recorded in Table VI and is documented for the benefit of all company workers.

TABLE VI  
CLASSIFICATION OF FOUND OBJECTS.

classification		location	production area	date	23/05/2022
		manager name		Elmer Rojas	
Nº	Article	Quantity	object type	they are useful?	destination
1	Dishes	4	unnecessary	No	discard them
2	pots	10	necessary	Si	organize them
3	Backpacks	1	unnecessary	No	discard them
4	Baking powder packages	2	necessary	Si	organize them
5	Plastic bags	50	necessary	Si	organize them
6	Empty supply boxes	7	excess	Si	sell
7	Easels	2	necessary	No	organize them
8	Brooms	3	damaged	Si	repair
9	Plastic tubes	5	unnecessary	No	discard them
10	Oven mitts	2	necessary	Si	organize them
11	Wooden plates	6	necessary	Si	organize them
12	Supplies	15	necessary	Si	organize them
13	Toiletries	4	necessary	Si	organize them
14	empty plastic bags of 50 kg	12	excess	No	discard them
15	empty buckets	9	excess	Si	transfer
16	trays	15	necessary	Si	organize them
17	kitchen materials	17	necessary	Si	organize them

#### Seiton Implementation

Only the necessary objects that were the result of the Seiri were ordered. To order these objects, the parameter of frequency of use of these was taken into account. The frequency of use was divided into five categories, which were the following (Table VII):  
Every moment, several times a day. It was assigned a location close to the person, close to the work area, inside the shelf and in common areas or distant areas.

TABLE VII  
ORDER OF NECESSARY OBJECTS.

Order		location	production area	date	23/05/2022
manager name					
Nº	Article	Quantity	necessary (yes or no)	frequency of use	location
2	Pans	10	yes	Many times per week	
4	Baking powder packets	2	yes	Several times a day	
5	Plastic bags	50	yes	In every moment	
7	Easeld	2	yes	Many times per week	
10	Oven gloves	2	yes	Several times a day	
11	Wood sticks	6	yes	Several times a day	
12	Supplies	15	yes	In every moment	
13	Toiletries	4	yes	Several times a day	
16	Trays	15	yes	Several times a day	
17	Kitchen materials	17	yes	In every moment	

### Seiso Implementation

A general cleaning manual was made to designate the daily functions of each worker in addition to being the owner of the business. All the tasks of each worker and the days of the month that they perform a cleaning task were completed.

MANUAL DE LIMPIEZA		Ubicación	Área de producción y ventas		Fecha	23/05/2022																														
			mes		Version	1																														
Nº	RESPONSABLE	DESCRIPCION DE LA TAREA	EQUIPO DE LIMPIEZA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1	Eliet Rosas	Limpieza de mesa de trabajo	Paño, desinfectante																																	
2	Victor Espinoza	Limpieza de piso	escoba, recogedor																																	
3	Diana Meza	Limpieza de los materiales	pañó húmedo																																	
4	Marcelo Rosas	Limpieza de las máquinas	Trapo usado																																	
5	Juana Salas	Mantenimiento final de sacos de basura	Bolsa de basura																																	
6	Joel Salas	Limpieza de carritos para pan y bandejas	Esporja																																	
7	Carlos Soto	Limpieza de muebles y mostrador	Limpificador en gel																																	

Figure 8: Manual of General Cleaning of the Bakery.

### Implementación de Seiketsu

Se realiza distintas implementaciones de normas visibles y sencillas para dejar evidencia de la aplicación de esta herramienta y así facilitar el desempeño laboral de los trabajadores del área de producción, en ayudar a mejorar la

eficiencia y productividad de estos. Estas normas visuales utilizadas para estandarizar la propuesta fueron las siguientes:

Marcar el piso: Se marcó el piso con cinta de diferentes colores para colocar un determinado grupo de objetos. Y así, poder identificar las áreas determinadas de cada objeto a selección.



Figure 9 : Areas of the Floor Marked in the Production area

Product Label: For a better visualization of the production processes, they were labeled to reduce the times and risk of mistake and clearly know where the inputs and production processes are.

Indicator	Before implementation	After implementation	Variation (minutes)	% Efficiency
average time of heavy	5.34	4.32	1.02	23.61%
Time mixed average	9.18	8.27	0.91	11.00%
average kneading time	8.2	7.56	0.64	8.47%
Time average refinement	5.35	4.37	0.98	22.43%
average time of stretched	4.23	4.05	0.18	4.44%
average cutting time or division	3.15	2.5	0.65	26.00%
Tiempo promedio de formado	3.28	3.02	0.26	8.61%
average forming time	180	170	10	5.88%
average heating time oven	40	40	0	0.00%
Time average bake	12.5	11.5	1	8.70%
average time of cooled	15	15	0	0.00%
TOTAL	286.23	270.59	15.64	5.78%



## Shitsuke Implementation

Finally, one month after the implementation in Shitsuke, the process of authoring the results was carried out, having already implemented the previous S. On the other hand, the results obtained in the internal file of the 5S were projected on a radar graph to determine visually based on the data obtained if the results were met or it can be improved. S



Figure 10: 5S Internal Audit Radar Chart

The results of the radar graph is that of "Select" a 5 was obtained, in "Order" a 4.5, in "Clean" a 4, in "Standardize" a 5 and finally in "Discipline" a 4. Which means that there are improvements to be made in each S to obtain better results in favor of the company.

- c) Taking Time for Processes in the Production area after the implementation of the 5S

After the implementation of the 5S, the times were taken again for each process involved in the elaboration of the French plan because it is the bread with the greatest demand from the bakery and to verify if the implementation of this tool had worked.

### V. DISCUSSION OF THE RESULTS

Before carrying out a discussion of the results, the results obtained will be detailed below. An acceptable result has been obtained in indicating the level of efficiency in the mixing process. After carrying out Cleaning and order in the production area, with the indicated selection and relocation of the supplies, and labeling them to give a great visual range, the post-implementation measurement was carried out, which showed a result of 97.86%.

EFFICIENCY LEVEL INDICATOR IN THE MIXING PROCESS			
	RAW MATERIAL USED IN (gr)	RAW MATERIAL AVAILABLE IN (gr)	RESULTS
PRE IMPLEMENTATION	352,023.00	370,695.00	94.96%
POST IMPLEMENTATION	327,650.00	334,820.00	97.86%
FORMULA	%E.P.M= (RAW MATERIAL USED/RAW MATERIAL AVAILABLE)*100		97.86%
SATISFACTION THRESHOLDS	SATISFACTORY (98% AND MORE)	ACCEPTABLE (95% TO 97.9%)	CRITICAL (LESS THAN 95%)
		X	

Figure 11: Results Indicator of Level of Compliance with Daily Production Standards

In the following indicator, a satisfactory result was obtained. Likewise, the indicator decreased by more than 0.24%, reflecting the reduction of defective breads in bread production.

INDICATOR OF LEVEL OF COMPLIANCE WITH DAILY PRODUCTION STANDARDS			
	DEFECTIVE BREADS PER WORKING DAY	PRODUCED BREADS	RESULTS
PRE IMPLEMENTATION	25	4680	0.53%
POST IMPLEMENTATION	12	4900	0.24%
FORMULA	%C.E.P= (1-(DEFECTIVE BREADS/PRODUCED BREADS))		0.24%
SATISFACTION THRESHOLDS	SATISFACTORY (LESS THAN 0.3%)	ACCEPTABLE (0.3% TO 0.5%)	CRITICAL (GREATER THAN 0.5%)
	X		

Figure 12: Results of Accomplished Bread Sales.

### VI. CONCLUSIONS

In the course of this investigation, it was possible to determine that the main problems of most of the Mypes and in the study company were management, disorder, low productivity and poor standardization, which many companies focus on today and they do not have short and long future strategies. For this reason, after an analysis and proposals applied in similar cases, it was considered feasible to use the Lean Manufacturing methodology in it, the 5S tools and a continuous improvement methodology. This is how at the beginning the use of the 5S tool is proposed, these principles are applied in companies with the proposal to establish quality control, it is also a tool that offers multiple benefits. Also, it is known as the 5S method because it is based on 5 stages and these are composed to keep any company functional, and they are the following: Seiri, classification and separation between useful and non-useful, Seiton, organization throughout the place work, Seiso, Cleaning in the company, Seiketsu, normalization and corrections, and shitsuke that is discipline and commitment to continue complying with the 5S.

It is important to know, it is not easy to change the way a person works and even less to change the way an area of a company works, but the most difficult thing is to maintain those changes. Through the application of this tool in the organization, results were seen in the improvement of the internal organization, the effective working time was optimized, our time between tasks or activities was eliminated,

the necessary work material was reduced to a minimum and with this At the same time, it gains useful space, a clean and friendly work environment for the workers was achieved, the level of productivity also increased, the organization had a greater focus on the main activities of the business.

After having carried out a feasibility study and the application of some lean tools in the organization, we consider that the required purposes have been fulfilled. Using 5S and visual control, the company has reduced delays by a favorable percentage. Initially, the percentage that was had in the works by material produced was between 5% to 10%. Now with the help of 5S and visual controls, we see that this favored this aspect since the percentage was reduced, not completely, but at least significantly, from 2% to 5%. It is considered to have achieved the objectives established at the beginning of the investigation, which included the use of lean tools to improve the productive conditions of the system and reduce time delays in production.

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