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EVALUACIÓN Y MITIGACIÓN DE RIESGOS LABORALES MEDIANTE SISTEMAS DE SEGURIDAD INDUSTRIAL EN UNA PLANTA AGROINDUSTRIAL DE PROCESAMIENTO DE VEGETALES Y ALIMENTOS

EVALUATION AND RISK MITIGATION THROUGH INDUSTRIAL SAFETY SYSTEMS IN A VEGETABLE AND FOOD PROCESSING AGRO-INDUSTRIAL PLANT

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RESUMEN: La industria agroalimentaria de procesamiento de vegetales presenta entornos laborales complejos donde coexisten riesgos mecánicos por maquinaria de corte, riesgos biológicos, superficies húmedas propensas a caídas y exposición a bajas temperaturas. El objetivo de este estudio fue evaluar el impacto de la implementación de un Sistema de Gestión de Seguridad Industrial, alineado a la norma ISO 45001, en una planta procesadora de alimentos preparados para mitigar la siniestralidad laboral y asegurar la continuidad operativa. La metodología adoptada contiene un enfoque cuantitativo, de alcance descriptivo correlacional, estructurada en tres fases: diagnóstico de línea base mediante matrices de Identificación de Peligros y Evaluación de Riesgos (IPERVR), diseño del sistema documental operativo, y medición post-intervención de indicadores de gestión. Los principales resultados evidenciaron una reducción significativa del 64% en el índice de frecuencia de accidentes de trabajo y una disminución del 72% en los días perdidos por siniestralidad en un periodo de doce meses. Asimismo, se optimizó el cumplimiento legal normativo del 42% al 95% y se comprobó que las medidas de ingeniería aplicadas mitigaron los riesgos ergonómicos en las líneas de empaque automatizadas. Se concluye que en la estructuración sistemática de la seguridad industrial no solo salvaguarda la integridad física y mental del capital humano, sino que genera una sinergia directa con los sistemas de inocuidad

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alimentaria (HACCP) disminuyendo de manera cuantificable el ausentismo y fortaleciendo la sostenibilidad productiva de la organización agroindustrial.

Palabras clave: Seguridad industrial; industria alimentaria; gestión de riesgos; ISO 45001; salud ocupacional; accidentes de trabajo

ABSTRACT: The agro-food industry dedicated to vegetable processing operates in complex work environments where mechanical hazards associated with cutting machinery, biological risks, slippery wet surfaces, and exposure to low temperatures coexist. The aim of this study was to evaluate the impact of implementing an Industrial Safety and Occupational Health Management System, aligned with the ISO 45001 standard, in a food processing plant to mitigate occupational accidents and ensure operational continuity. The research adopted a quantitative approach with a descriptive-correlational scope and was structured into three phases: baseline diagnosis using Hazard Identification and Risk Assessment (IPERVR) matrices, design of the operational management system, and post-intervention evaluation of management indicators. The results revealed a significant 64% reduction in the occupational accident frequency rate and a 72% decrease in workdays lost due to occupational injuries over a twelve-month period. Likewise, legal compliance improved from 42% to 95%, and the engineering controls implemented effectively mitigated ergonomic risks in automated packaging lines. It is concluded that the systematic implementation of industrial safety management not only protects workers' physical and mental well-being but also strengthens the synergy with food safety systems (HACCP), reducing absenteeism and enhancing the productive sustainability of the agro-industrial organization.

Keywords: Industrial safety; food industry; risk management; ISO 45001; occupational health; occupational accidents

INTRODUCTION

The global agri-food industry represents one of the most dynamic and essential productive sectors for supplying supply chains; However, their operating environments harbor a complex matrix of hazards that compromise the occupational health and safety of human capital (1). Specifically, plants dedicated to the processing of vegetables and prepared foods configure critical work scenarios where high-speed automation lines, handling of sharp tools, continuous exposure to low temperatures in post-harvest areas and cold rooms, and the persistence of humid surfaces derived from the washing and sanitizing phases coexist simultaneously (2). These factors exponentially increase the probability of occurrence of occupational accidents, such as entrapments, amputations, falls at the same level and musculoskeletal disorders derived from repetitive movements and forced postures in the selection and packaging stations (3). According to data from the International Labor Organization (ILO), both incidents and occupational diseases not only undermine the integrity of the worker, they also impose financial burdens on organizations, which impacts productivity and intersectoral competitiveness (4).

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In Latin America, risk management in the agroindustrial sector presents additional challenges related to the heterogeneous compliance with current legal frameworks and the limited adoption of systematic preventive methods (5). Historically, food processing companies have prioritized the implementation of rigorous food safety schemes, such as Hazard Analysis and Critical Control Points (HACCP) and the ISO 22000 standard, relegating operator safety to a secondary or reactive level (6). However, contemporary scientific literature demonstrates that a work accident in an agri-food production line not only paralyzes the manufacturing flow, but also introduces potential vectors of biological or cross contamination in the product, evidencing a direct interdependence between work safety and the final quality of the food (7, 8). Consequently, migration towards proactive management models that unify both protection criteria is essential.

During the last five years, international developments in occupational health have established the ISO 45001 standard as the global reference standard for the structuring of Occupational Health and Safety Management Systems (SGSST) (9). This framework bases its operation on the continuous improvement cycle PHVA (Plan, Do, Check, Act) and requires rigorous identification of hazards, risk assessment and determination of controls through a technical hierarchy that prioritizes elimination, replacement and engineering controls over the use of Personal Protective Equipment (PPE) (10). In plant processing plants, the systematic application of Hazard Identification and Risk Evaluation with Results Assessment (IPERVR) matrices allows quantitative mapping of the criticality of each operational position, facilitating the efficient allocation of financial resources for technological mitigation and ergonomic redesign of jobs (11, 12).

Despite the conceptual advantages offered by these integrated management systems, there is a gap in local empirical research regarding the exact quantification of their effectiveness after being implemented in agroindustrial SMEs in the region. Several authors maintain that the success of risk mitigation depends on the organizational culture and the adequacy of controls to the biological and hygienic particularities of food manufacturing, where many conventional engineering materials cannot be used due to sanitation regulations (13, 14). Therefore, empirically evaluating the impact of an industrial safety system adapted to these restrictions becomes a scientific and corporate imperative.

The justification of this research is based on the need to provide metric evidence that is reproducible that demonstrates how the technical structuring of an industrial safety system can statistically significantly reduce accidents within a vegetable processing plant. The study directly addresses the problem of high frequency with minor incidents and absenteeism on packaging lines. To guide the development of the research, the following hypothesis is proposed: the implementation of a safety management system focused on engineering controls and IPERVR matrices significantly reduces the frequency and severity rates of workplace accidents compared to the initial operational baseline.

Although there are methodologies that are widely used for the management of occupational health and safety, their implementation within the food industry presents specific limitations. Many organizations maintain reactive approaches that were based on the investigation of accidents that have occurred, instead of developing preventive

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strategies based on the systematic identification of hazards. The conditions inherent to food processing, such as the permanent presence of humidity, slippery surfaces, strict hygiene protocols, thermal variations and continuous operation of automated equipment, make the application of some conventional safety controls difficult. These characteristics generate the obligation to adapt risk assessment tools to the particular conditions of the food sector, prioritizing engineering controls compatible with safety and production requirements.

Based on the above, the general objective of this study is to evaluate the effectiveness of the implementation of an industrial safety and occupational health management system for the mitigation of occupational risks in an agroindustrial vegetable and prepared food processing plant. The specific objectives include: 1) Diagnose the initial situation of the plant through the legal compliance index and the qualitative assessment of risks by position; 2) Design and implement technical mitigation measures and standardized operating procedures under the ISO 45001 standard; and 3) Monitor and statistically contrast the ex-ante and ex-post intervention accident rate indicators over a twelve-month time horizon.

MATERIALS AND METHODS

This research was structured under a quantitative approach, with a descriptive-correlational scope and a quasi-experimental longitudinal ex-ante and ex-post design (15). This design allowed us to evaluate the behavior of the dependent variables, represented by the accident rates, before and after the introduction of the independent variable, corresponding to the industrial safety management system based on the ISO 45001 standard (11, 15). The study scenario consisted of a medium-sized agroindustrial plant dedicated to the processing and packaging of fresh vegetables and prepared foods, with an active working population of 120 operators distributed in three rotating shifts. Due to the size of the population and in order to avoid sampling errors, a complete census was chosen, including all workers who performed direct operational functions in the areas of raw material reception, washing, automated cutting, packaging lines and storage in freezing chambers (15).

To guarantee the homogeneity of the analyzed population, inclusion and exclusion criteria were established. Only operational workers with an active contract and a minimum stay of six months in the plant were included, because they had continuous exposure to the risks inherent to the production process. Interns, administrative personnel without regular entry to production areas, occasional contractors and workers with prolonged medical disabilities or pre-existing pathologies that could alter the accident rate indicators related to the work activity carried out during the study period were excluded.

The methodological development was executed sequentially over a time horizon of 12 months, which is divided into three well-defined operational phases. The first phase consisted of the baseline diagnosis and hazard survey. Therefore, a checklist was applied based on current national legal regulations regarding occupational health and safety, which determined the initial percentage of technical compliance of the company.

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Simultaneously, the Hazard Identification and Risk Evaluation with Results Assessment Matrix (IPERVR) method was used, methodologically adapted from the Colombian technical standard NTC 45 and the ILO guidelines for food manufacturing (11, 12). Using this tool, quantitative values were assigned to the level of deficiency, level of exposure and level of consequence to calculate the Risk Level (NR), which categorized the dangers detected into four acceptability scales: trivial, tolerable, moderate and intolerable.

Prior to their application, both the checklist and the IPERVR matrix were subjected to a validation process through the judgment of three experts with experience in industrial safety, occupational health and risk management in the food industry, who evaluated the relevance, clarity and consistency of each criterion. Subsequently, agreement between evaluators was determined using the Fleiss Kappa coefficient, obtaining a value of 0.84, considered an almost perfect level of agreement, which demonstrated adequate reliability of the instrument and reduced possible bias during risk assessment.

The second phase included the design and implementation of the technical mitigation measures of the management system. Strictly following the hierarchy of controls established by international security standards, engineering solutions were prioritized over administrative ones (10). Specifically, the cutting machinery was intervened by placing fixed physical guards and emergency stop switches with interconnected magnetic sensors. To counteract the risk of falls on wet surfaces, a non-slip epoxy coating treatment with high mechanical and chemical resistance was applied to the floors in the washing areas. In the packaging lines, an ergonomic redesign of the workstations was carried out by installing height-adjustable tables and rest platforms to mitigate musculoskeletal disorders due to prolonged standing and repetitive movements. Overall, there was a standardization of the document management system through the creation of Standard Operating Procedures (SOP) for high-risk tasks with technical training programs and the provision of Personal Protective Equipment (PPE) that contains specific certification for humid and low-temperature environments.

The third and final phase consisted of monitoring with statistical evaluation of the results after a system maturation period of twelve months. Safety key performance indicators were calculated monthly using formulas standardized by the International Labor Organization. The Frequency Index (IF) was determined by the relationship between the total number of work accidents multiplied by a factor of 10^6 and divided by the total man-hours actually worked during the period. The Severity Index (GI) was calculated by dividing the number of days lost due to accidents multiplied by the same factor of 10^6 on the man-hours that were worked. Finally, the work absence rate was calculated by subtracting the days of medical absence from the total planned days.

The comparative analysis of all the data collected in the ex-ante and ex-post phases was processed using the statistical software SPSS version 25. To validate the research hypothesis by determining whether the differences between both periods were statistically significant, Shapiro-Wilk normality tests were applied. Subsequently, the parametric Student's t test for related samples was implemented for the indicators that presented a normal distribution, and the non-parametric test of Wilcoxon signed ranks for the non-linear behavioral variables, setting a confidence level of 95% and a statistical significance value of $p < 0.05$.

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RESULTS

Baseline Diagnosis and Percentage of Initial Legal Compliance

The initial technical diagnosis carried out in the agro-industrial vegetable processing plant made it possible to quantitatively determine the level of compliance with the legal regulatory framework in occupational safety and health. The application of the structured checklist showed that the organization operated under a markedly reactive scheme, registering a global compliance rate of only 42% with respect to technical obligations. The greatest deficiencies were concentrated in the document management axes with 15% compliance, where there was evidence of the non-existence of Standard Operating Procedures (SOPs) for critical tasks, the absence of a plan with structuring of training and the lack of auditable records of the delivery of personal protective equipment. In the axis of physical and engineering conditions, compliance has a scope of 35%, detecting cutting machinery deprived of physical guards with the absence of accessible emergency stop systems and a general deterioration of the non-slip coating in the washing and sanitizing areas, which increased the continuous risk of falls at the same level due to the accumulation of constant humidity and organic plant residues. The only axis that showed an acceptable level of compliance was the formation of the joint security body (80%), although its monthly minutes showed a punitive and not preventive approach to the reported incidents.

Hazard Identification and Initial Risk Assessment (IPERVR Matrices)

The quantitative diagnosis phase using the Hazard Identification and Risk Evaluation Matrix with Results Assessment (IPERVR) method allowed mapping the criticality of a total of 45 jobs evaluated in the three operational shifts. The ex-ante analysis obtained an identification of a predominance of risks categorized as Intolerable and Moderate, being directly linked to the geometric and operational nature of the processing lines. In the automated cutting and cubing position, the mechanical danger due to trapping and cutting related to direct access to the high-speed blades contains a Risk Level that is classified as Intolerable, deriving it from a deficiency level of 10, a continuous exposure level of 4 and a very serious consequence level being evaluated at 60 points. As in the washing and sorting area, the physical danger due to exposure to wet and slippery surfaces is assessed as a Moderate risk with a high probability of occurrence. In manual packaging and palletizing stations, the ergonomic dangers associated with repetitive movements of the upper extremities with prolonged standing and forced postures are unanimously classified as Moderate risks that have a tendency to evolve into occupational diseases.

Table 1. Comparative Matrix of Critical Risks by Job Ex-Ante and Ex-Post Intervention.

Position Job	Hazard Identified	ND(ex)	NE(ex)	NR(Ex-Ante)	ND(post)	NE(post)	NR(Ex-Post)	Control of Engineering

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Evaluated								Applied
Reception and Selection	Ergonomic: Forced postures and prolonged standing.	6	3	**Moderate**	2	3	**Tolerable**	Ergonomic mats and adjustable resting platforms.
Washing and Sanitizing	Physical: Falls to the same level from wet surfaces.	6	4	**Moderate**	2	4	**Tolerable**	Non-slip epoxy coating with high efficiency drain.
Cutting and Cubing	Mechanical: Trapping and amputation by high-speed blades.	10	4	**Intolerable**	2	2	**Tolerable**	Fixed physical guards and magnetic emergency stop switches.
Line of Packaging	Ergonomic: Musculoskeletal disorders due to repetitive movements.	6	4	**Moderate**	2	2	**Trivial**	Redesign of work stations with adjustable height tables and hourly rotation.
Cold Rooms / Warehouse	Physical: Prolonged exposure to low temperatures.	6	3	**Moderate**	2	2	**Tolerable**	Automation of gates and thermal locks of insulation.

Quantitative Reduction of Workplace Accident Rates

After the twelve-month time horizon of maturation and continuous audit of the industrial safety management system based on the ISO 45001 standard, the key performance indicators (KPI) demonstrated a drastic transformation in the accident rate dynamics of the plant. The total number of accidents that are recorded at work annually contracted from 28 events in the baseline to only 10 events during the post-intervention period, which means a net decrease of 64.2%. When processing these data using the ILO's standardized equations, the accident frequency index (IF) experienced a statistically significant decrease, going from an initial value of 93.33 accidents per million man-hours worked to a rate of 33.33 at the end of the evaluation year. This reduction demonstrates the effectiveness of physical barriers and magnetic switches installed in automatic vegetable processing lines. On the other hand, the economic and operational impact of the system was reflected most strongly in the mitigation of days lost due to

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medical incapacity for work. The annual consolidated number of days not worked due to accidents went from 340 days in the ex-ante stage to 95 days in the ex-post stage, representing a reduction of 72.1%. When calculating the Severity Index (GI), the severity of the injuries was observed, which decreased from a value of 1133.33 days lost per million hours worked to 316.67 in the evaluated period. This behavior is directly attributed to the complete elimination of major accidents with severe disabling events such as amputations or complex fractures, with the remaining events being restricted to minor incidents with low severity such as minor contusions or superficial lacerations that required only first aid attention with immediate returns to work.

Table 2. Monthly Indicators of Accident Rate, Severity and General Absenteeism (Evaluated Period of 12 Months).

Months). Period / Month	Man-Hours Worked (HHT)	Number of Accidents (AT)	Days Lost (DP)	Frequency Index (IF)	Severity Index (IG)	Rate of Percentage Absenteeism
Baseline (Ex-Ante)	**300,000**	**28**	**340**	**93.33**	**1133.33**	**5.8%**
Month 1 (Start)	25,000	2	24	80.00	960.00	5.2%
Month 2	25,000	1	15	40.00	600.00	4.7%
Month 3	25,000	1	12	40.00	480.00	3.9%
Month 4	25,000	1	10	40.00	400.00	3.1%
Month 5	25,000	1	8	40.00	320.00	2.5%
Month 6 (Half)	25,000	0	0	0.00	0.00	2.1%
Month 7	25,000	1	7	40.00	280.00	1.9%
Month 8	25,000	0	0	0.00	0.00	1.8%
Month 9	25,000	1	5	40.00	200.00	1.6%
Month 10	25,000	0	0	0.00	0.00	1.6%
Month 11	25,000	1	4	40.00	160.00	1.5%
Month 12 (Closing)	25,000	1	10	40.00	400.00	1.5%
Consolidated (Ex-Post)	300,000	10	95	33.33	316.67	1.5%

Impact on Absenteeism Rates and Effectiveness of Ergonomic Controls

The optimization of environmental conditions and the ergonomic redesign of workstations had a direct influence on the availability of operational personnel. The plant's overall absenteeism rate, which averaged 5.8% per month at baseline due to constant medical leave for low back pain, tendinitis, and carpal tunnel syndromes in the packaging area, was steadily reduced until it stabilized at 1.5% at the end of the study period. The ergonomic control evaluation using the REBA (Rapid Entire Body Assessment) method during the automated packaging lines verified that the installation of adjustable rest platforms in conjunction with the scheduled rotation of shifts every two hours reduced the postural load from a critical action level with a score > 8 to a tolerable low risk level with a score < 3. Additionally, the non-slip epoxy treatment that was applied to the floors eradicated slip incidents by 100%. and falls in the vegetable washing area, obtaining a safe work environment that enhanced the performance of each operator.

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Statistical Validation of the Research Hypothesis

To confirm the scientific validity of the findings and rule out that the metric reductions were due to random fluctuations in production, the statistical significance analysis was carried out through SPSS software version 25. The Shapiro-Wilk normality test determined that the monthly data of the Frequency Rates and Severity Rates They followed a normal distribution $p > 0.05$. Applying the Student t test for related samples, comparing the monthly means of the ex-ante period versus the ex-post period, a value of $t = 5.42$ was obtained for the Frequency Index and for the Severity Index a value of $t = 6.18$. In both analyzes the bidirectional statistical significance value was $p = 0.001$, being markedly lower than the established critical threshold of $\alpha = 0.05$. These mathematical results allow for a categorical rejection of the null hypothesis and the formal acceptance of the research hypothesis, which demonstrates with 95% confidence that the implementation of the industrial safety management system that is based on IPERVR matrices and engineering controls significantly reduces the levels of accidents and severity of accidents in the vegetable processing plant.

DISCUSSION

The quantitative findings derived from this research strongly demonstrate the effectiveness of the implementation of an industrial safety management system based on the ISO 45001 standard and IPERVR matrices to mitigate accidents within the agri-food sector of plant processing. When critically contrasting the 64.2% reduction in the Frequency Rate (FI) of accidents obtained in this study, a clear convergence is observed with the trends reported by contemporary international scientific literature. Various authors maintain that the transition from a reactive security model to one structured under the continuous improvement of the PHVA cycle achieves drastic reductions in mechanical operational incidents, placing the general effectiveness range of these systematic interventions between 50% and 70% in industrial SMEs (9, 16). This validates that the nature of the food sector, despite its high rates of environmental humidity and high-velocity flows, responds positively to the technical standardization of operational controls (2).

A core analytical aspect in this research lies in the drastic contraction of 72.1% in days lost due to medical work disability and the consequent decrease in the Severity Index (GI). This behavior is different from previous research in conventional agro-industrial plants in the region, where it was argued that, although management systems reduced the overall number of incidents, the severity of the remaining mechanical events (such as amputations or entrapments in cutting machinery) tended to remain constant due to the lack of capital investment in hard physical barriers (17). In our case study, the total eradication of major disabling accidents is directly due to the strict prioritization of engineering controls—such as the installation of fixed physical guards and magnetic emergency stop switches in automated dicers—over traditional administrative measures or the mere use of Personal Protective Equipment (10). This methodological approach reinforces the premise that investment in collective engineering barriers is the

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only methodological avenue capable of altering the intrinsic severity of hazards in high-speed manufacturing environments (10, 11).

From an economic perspective, the implementation of the main engineering controls represented an approximate investment of USD 18,500, distributed among the installation of non-slip epoxy coatings, physical guards, magnetic emergency stop sensors and ergonomic adaptations of the workstations. However, the reduction in absenteeism from work from 5.8% to 1.5%, together with the decrease in days lost due to accidents, made it possible to recover an important part of said investment through the increase in hours actually worked, the reduction of costs associated with temporary replacements, medical care and payment of disability subsidies. Additionally, the strengthening of legal compliance reduced the risk of administrative sanctions derived from non-compliance with occupational health and safety regulations, demonstrating that the implementation of the management system constitutes a productive investment with economic and operational benefits for the organization.

On the other hand, the reduction of the general absenteeism rate from 5.8% to 1.5% after the execution of ergonomic redesigns using the REBA method and the application of non-slip epoxy coatings provides crucial empirical evidence on a latent discussion in the sector: that between worker safety and corporate productivity. Some researchers claim that recurring absenteeism on prepared food packaging lines is a structural factor that is difficult to mitigate due to the repetitive and monotonous nature of the position (18). However, the data collected demonstrate that by attenuating the postural load through adjustable platforms and programmed rotations, not only do musculoskeletal disorders decrease, but the continuity of the manufacturing line is stabilized. This corroborates the theoretical postulates that indicate that the costs of implementing a SGSST are absorbed organically by the organization by eliminating the extra costs associated with the temporary replacement of qualified personnel and the penalties for delays in the shipment of fresh products (1, 4).

Finally, it is imperative to recognize the limitations of the present study. Having been developed under a longitudinal quasi-experimental design focused on a single medium-sized agro-industrial company, the correlation coefficients and specific reduction rates of the plant sector cannot be directly generalized to other food branches of high biological complexity, such as the meat or dairy processing industries, where hygienic variables and pathogen risk vectors impose even more severe restrictions on conventional engineering materials (6, 14). The time horizon for post-intervention evaluation is limited to twelve months, which restricts the observation of the sustainability of the operators' preventive culture in the long term. It is suggested that for future lines of research, multicenter studies be carried out that evaluate the automated integration of IPERVR matrices with digital platforms with real-time monitoring, allowing the estimation with predictive statistical models of the probability of occurrence of accidents in the face of seasonal variations in production demand.

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CONCLUSIONS

It was diagnosed that the agro-industrial plant was initially operating under a reactive scheme with a legal compliance rate of only 42% in terms of occupational health and safety, with the greatest deficiencies concentrating on the lack of physical guards on automatic cutting machinery and the absence of standardized safe work procedures for humid environments. The Hazard Identification and Risk Evaluation with Results Assessment (IPERVR) matrix applied made it possible to map the critical levels of the jobs, classifying the mechanical dangers of entrapment as intolerable, while the risks of falls at the same level and ergonomic conditions due to repetitive movements in the packaging stations were characterized as moderate.

The design and implementation of the industrial safety management system, structured under the continuous improvement cycle of the ISO 45001 standard, strictly prioritized collective engineering controls over administrative ones. The key technical interventions were constituted with the installation of fixed guards with magnetic emergency stop sensors in the cubing lines, while the non-slip epoxy coating in the vegetable washing areas to nullify the surface humidity factor with the ergonomic redesign through adjustable stations, managed to comprehensively mitigate the severity of the dangers evaluated in the organization's baseline.

The statistical evaluation after twelve months of post-intervention monitoring demonstrated the effectiveness of the management system with a 64.2% reduction in the Accident Frequency Rate and a 72.1% contraction in the Injury Severity Index, which completely eradicates accidents due to major disabling injuries. Likewise, the rate of absenteeism from work decreased from 5.8% to 1.5% due to the control of musculoskeletal disorders. The parametric Student's t tests validated the research hypothesis with a high level of statistical significance of $p = 0.001$, demonstrating with scientific rigor that the proactive management of industrial safety drastically reduces accidents and absenteeism in the food company.

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