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Strengthening Risk Management Capacity through ISO 31000-Based Assistance and Risk Register Development: A Case Study of Idola Cookies MSME

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Abstract: Idola Cookies, a bakery micro, small, and medium-sized enterprise (MSME) in Jatimulyo Village, Klaten, Indonesia, shifted from a made-to-order business model to supplying 2,000–3,000 loaves per product type in each production cycle for the Free Nutritious Meals (MBG) program, while also fulfilling seasonal demand during Ramadan. This expansion increased the business's exposure to risks associated with production capacity, workforce availability, equipment, raw material supplies, product quality, food safety, and cash flow. However, the owner had no prior knowledge or experience in implementing a formal risk management framework. This community service program aims to introduce risk management principles and strengthen the MSME's capacity to manage business risks through hands-on assistance in developing a risk register based on ISO 31000:2018. The program involved introducing risk management principles, assisting the owner in establishing the business context and risk criteria, identifying risk sources and events, analysing and evaluating risks, and formulating appropriate risk treatment strategies. Program evaluation was conducted through observation, interviews, and an assessment checklist to assess partner participation, understanding, and the completeness of the resulting risk register. Data were analysed descriptively and qualitatively, while risk levels were determined using a 5 × 5 likelihood–impact matrix. The program resulted in a risk register documenting 18 risks across eight categories, comprising six very high, eight high, and four medium risks. Five risk treatment strategies were formulated: avoidance, reduction, transfer, deferral, and retention, with risk reduction emerging as the predominant strategy. The resulting risk register provides an initial practical framework for incorporating risk considerations into routine business decisions and promoting more systematic business management.

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Introduction

Micro, Small, and Medium Enterprises (MSMEs) are pillars of the national economy that play a role in job creation, income distribution, and local economic resilience. Their flexible, community-based characteristics make MSMEs relatively adaptive to market dynamics, but they are also, vulnerable to various types of business risks. The Klaten Regency has a growing MSME ecosystem; data from the Klaten Regency Office of Trade, Cooperatives, and MSMEs records 103,393 MSME actors consisting of micro, small, and medium enterprises. UMKM actors in Klaten are dominant in the food industry subsector, including producers of wet and dry cakes. This type of business is generally family-run with a

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simple managerial structure and non-standardized record-keeping, so that procurement, production, distribution, and financial activities are conducted informally, and risks are rarely identified systematically.

Risk management is a structured process for identifying, analyzing, evaluating, and addressing risks, namely the effects of uncertainty on organizational objectives (Vochitoiu et al., 2020). ISO 31000:2018 places this process within the cycle of communication and consultation, establishing the scope–context–criteria, risk assessment, risk treatment, monitoring and review, as well as recording and reporting. A similar framework was developed in Enterprise Risk Management and has been examined in the context of small and medium-sized enterprises (Ahmad & Teo, 2024). In practice the risks experienced by food MSMEs include production failure, cash flow instability, fluctuations in prices and supply of raw materials, changes in demand, and other operational disruptions that reduce business resilience (Ciocoiu et al., 2025; Lestari, 2025).

In the food sector, food safety risk represents a critical risk category in bakery operations because it directly affects consumer health, product quality, and business reputation. Within the ISO 31000:2018 risk management framework, food safety risks should be systematically identified, analyzed, evaluated, and treated as part of the overall risk management process. Their treatment requires the adoption of appropriate preventive and control measures, particularly good hygiene practices and Hazard Analysis and Critical Control Point (HACCP) principles, to prevent, eliminate, or reduce food safety hazards to acceptable levels. These requirements are reflected in international food safety standards established by and regulated in Indonesia through Government Regulation Number 86 of 2019 concerning Food Safety. Previous community service initiatives have demonstrated the importance of HACCP assistance and improved hygiene practices in MSME bakery operations (Nofitasari et al., 2026). Therefore, integrating food safety considerations into an ISO 31000-based risk register is essential to ensure that food safety hazards are recognized as critical business risks and addressed through systematic risk treatment measures.

Several community service activities have addressed risk management in MSMEs, generally through outreach, counselling, and training (Dwiputri et al., 2025; Haji et al., 2026; Turgay & Aydin, 2023), as well as assistance in business risk identification and mitigation (Haji et al., 2026). Building on these initiatives, this activity focuses on strengthening the risk management capacity of an MSME that previously had no formal knowledge or documented system for managing business risks. Rather than providing general training alone, the activity involves direct, participatory assistance to the business owner in understanding the ISO 31000:2018 framework, identifying and assessing business risks, determining risk priorities, and developing a practical risk register with corresponding treatment plans. Its distinctive contribution lies in addressing the challenges of a sudden increase in production scale resulting from a partnership with a government program, which coincided with the seasonal peak in demand during Ramadan. Furthermore, the resulting risk register incorporates a structured assessment and five risk response strategies: avoidance, reduction, transfer, deferral, and retention (Ciocoiu et al., 2025; Yun & Ülkü, 2023).

The activity partner is MSME Idola Cookies in Dusun Tandantraman RT 04 RW 01, Jatimulyo Village, Pedan District, Klaten Regency. This business has been operating for approximately eight years and is established as a home industry with a made-to-order production system, and produces bakery bread, cookies, pastry, bluder bread, sisir bread, unyil bread, muffins, as well as various types of dry cakes (Figure 1). During Ramadan, this business produces a larger quantity of seasonal dry cakes, including sago cookies, nastar,

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kastengel, putri salju, semprit cookies, klepon nastar, and coco flakes. This business has grown after entering into a partnership with the Free Nutritious Meals (MBG) program, which requires the production of approximately 2,000–3,000 loaves for a single product type in one cycle.



Figure 1. Idola Cookies products (assorted cookies in jars and almond muffins)

Based on the situational analysis, the partner's problems are as follows: (1) The partner does not yet have a structured system for risk identification and mapping in the production and operational processes. (2) The scaling up of production as a result of the MBG partnership creates new potential operational risks. (3) Skilled human resources in bakery production are limited to support greater capacity. (4) Production time management is constrained due to the relatively short lead time for orders from business partners. A risk register or risk list that can serve as a basis for risk management and mitigation in production has not been developed. The objectives of this activity are (1) to assist the partner in identifying, analyzing, and evaluating business risks according to the ISO 31000:2018 process; (2) to develop a risk register containing risk types, events and causes, assessment, treatment, mitigation implementation, and response strategies; and (3) to formulate a monitoring mechanism so that the risk register can be used sustainably by the partner (Hardjomidjojo et al., 2022).

Method

The activity was carried out at Idola Cookies MSME, Jatimulyo Village, Pedan District, Klaten Regency, from May to August 2026, using a participatory mentoring approach, in which the owner and employees were involved in every stage so that the results could be utilized independently by the partner (Dahliani & Sulaksono, 2024). The participants were the business owner and 10 employees from the production, packaging, and procurement divisions. The stages of the activity are shown in Figure 2.

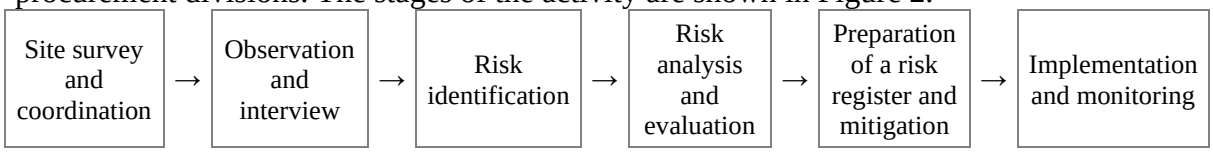


Figure 2. Risk management mentoring implementation flow

Data were collected through direct observation of the production process, semi-structured interviews with the owner and employees, and group discussions to validate the identified risks and their assessment values. The data collection instruments consisted of a semi-structured interview guide, observation sheet, and document review checklist. Risk assessment employed a 5×5 likelihood-impact matrix, with risk scores calculated by multiplying probability and impact. Risk treatments were selected from five response strategies and accompanied by residual risk targets, representing the expected risk levels after mitigation. Activity evaluation focused on three dimensions: the availability of a risk register

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agreed upon by the business partner, the owner's understanding and ability to identify and prioritize risks in production-related decisions, and the initial adoption of monitoring forms and checklists in routine production activities. Evaluation was conducted through reflective discussions, observations of partner participation, and reviews of completed risk registers and operational forms. Data were analyzed descriptively and qualitatively by examining observation records, interview findings, discussion results, and document completeness to assess the outcomes of assistance.

Result and Discussion

Through observation, interviews, and focus group discussions, 18 risks were identified across eight categories: operations and production (four risks), human resources and OHS (two), facilities and energy (three), supply chain (two), quality and food safety (two), finance and administration (three), compliance and legality (one), and market and strategic (one). Each risk is described in terms of event, cause, and impact, and then assessed for its probability and impact. The results constitute the first part of the risk register Table 1.

Table 1. Risk Register, Part A: Risk Identification, Analysis, and Evaluation (Inherent Risks)

ID	Risk Categories	Risk events and causes	Impact	P	I	Score	Level
R01	Operations & Production	MBG order products completed or shipped after the delivery deadline. Short deadlines from partners, unplanned production schedule, volume of 2,000–3,000 breads per product type, overlap with Ramadan orders.	Reprimands or penalties from partners; loss of trust; continued collaboration at risk.	4	5	20	Very high
R02	Operations & Production	Orders received exceed actual production capacity. Daily capacity has not been calculated; tendency to accept all orders; and simultaneous MBG and Ramadan demands.	Orders failed to be fulfilled, declining quality, excessive overtime, and customer complaints.	4	4	16	Very high
R03	Operations & Production	Bread is damaged, crushed, or arrives late during distribution. Insufficiently sturdy packaging, product packaged while still warm, limited fleet, and traffic obstacles.	Rejected product, rework costs, and delayed delivery.	3	3	9	Moderate
R04	Operations & Production	Some batches failed (burnt, misshapen, and did not rise). Unstable oven temperature, dough inconsistency, and worker fatigue.	Loss of materials and time in small quantities.	4	2	8	Moderate
R05	Human Resources & Occupational Safety and Health	Insufficient skilled labor new staff not yet proficient, employees resign or are absent. Limited availability of bakery workers around the location; sudden recruitment; no written SOP yet.	Productivity and quality decline; schedules are delayed; the workload of existing employees increases.	4	4	16	Very high

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ID	Risk Categories	Risk events and causes	Impact	P	I	Score	Level
R06	Human Resources & Occupational Safety and Health	Workers suffer burns, slips, or injuries due to fatigue. High-temperature oven; slippery floor; long overtime; newly arranged workspace not yet organized; limited personal protective equipment (PPE).	Injured worker, medical expenses, halted process, and business owner's responsibility.	3	4	12	High
R07	Facilities & Energy	Mixer, oven, or other critical equipment damaged during production. High and sustained workload; maintenance not yet scheduled; new equipment not yet tested.	Production halted, deadlines missed, and sudden repair costs.	3	5	15	High
R08	Facilities & Energy	Power outage or insufficient power; LPG gas runs out during production. The installed power at the new location is limited, many devices are operating simultaneously, and the LPG stock is low.	Dough or product failure, and production delays.	3	4	12	High
R09	Facilities & Energy	Pests (rats, cockroaches, flies) or droppings appear in the production area of the new location. The rented building has not been modified; materials are stored uncovered; and sanitation has not yet been scheduled.	Contamination, waste materials, food safety risks, and business images.	3	3	9	Moderate
R10	Supply Chain	The prices of flour, sugar, butter, or eggs rise, or goods become scarce. The causes were a surge in demand during Ramadan, supply disruptions, and dependence on a single supplier.	Production costs have increased, margins have decreased, and the agreed price is no longer appropriate for the current situation.	4	4	16	Very High
R11	Supply Chain	Materials arrive late or do not meet quality standards (cracked eggs, spoiled butter, damp flour). Single supplier, no inspection at receipt, sudden ordering.	Delayed production, decreased quality, and wasted materials.	3	3	9	Moderate
R12	Food Quality & Safety	The size, weight, taste, or texture of the bread was inconsistent between batches or among workers. Measurements based on estimates; many new workers; tight deadlines; unstable oven temperature.	Products that do not meet partner specifications, returns, and declining reputation.	4	4	16	Very High
R13	Food Quality & Safety	Contaminated, spoiled, or unhygienic products are delivered to the recipient. Non-standardized personnel hygiene, uncontrolled cooling and storage–	Recipient's health problems, termination of partnership,	2	5	10	Tinggi

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ID	Risk Categories	Risk events and causes	Impact	P	I	Score	Level
		delivery times, large volumes, and the use of ingredients prone to spoilage.	sanctions, and reputational damage (most severe impact).				
R14	Finance & Administration	Insufficient cash for materials, wages, and rent before partner payments are received. Large initial working capital requirements; installment or delayed payments; mixing of business and personal finances.	Materials not purchased, wages delayed, and production halted.	4	5	20	Very High
R15	Finance & Administration	Rental investment in premises and equipment is not recovered because of declining volume or termination of cooperation. Dependence on a single partner; specifications or contracts may change; pro policygram berada di luar kendali usaha.	Rental and installment expenses continue to accrue, equipment remains idle, and significant losses are incurred.	3	5	15	High
R16	Finance & Administration	Stock, cost, and production data were not recorded, resulting in the unknown cost of goods manufactured (HPP). Informal administration typical of family businesses; no standardized forms are in place yet.	Incorrect selling price, undetected waste, and data-uninformed decisions.	4	3	12	High
R17	Compliance & Legality	Permits or certifications for the new production site are incomplete or do not meet partner requirements. New production location, legal status not yet inventoried, limited regulatory information.	Orders halted, administrative sanctions, negative images.	3	4	12	High
R18	Market & Strategy	Surge in demand during Ramadan followed by a sharp decline, or demand patterns that are difficult to predict. The seasonal nature of cookies; lack of demand forecasting; and reactive marketing.	Excess or shortage of stock, and unstable income.	4	3	12	High

Notes: P = probability; I = impact; score = P × I.
Source: results of observation, interviews, and group discussions with partners.

Following risk identification, risks are analyzed based on their likelihood and impact to determine their levels (low, moderate, high, or extreme). Risk evaluation then compares these levels with established criteria to prioritize mitigation. The results are presented in Table 2.

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Table 2. Risk register: risk handling, mitigation implementation, response strategies, and residual risk

ID	Risk management (plan)	Mitigation implementation	Response strategies and rationale	Residual risk target	PIC and monitoring indicators
R01	• Production schedule counts back from delivery time (backward scheduling) per cycle • Division of shifts and workstations (dough preparation, forming, baking, packaging) • Buffer time before delivery time and Confirmation of quantity and delivery time on	A daily production schedule format is prepared, containing the start time of each stage, person in charge, completion time, and delivery time, and used in the MBG production cycle.	Reducing the probability of delay through time management planning.	8 (Moderate) P2 × I4	Owner; person in charge of production. Indicator: percentage of on-time deliveries.
R02	• Calculate maximum daily capacity (number of ovens × trays × cycles) • Close pre-order when quota is full • Prioritize MBG commitments; move regular orders to the next schedule	The capacity per machine is calculated; the quota for Ramadan cookie orders and the order closing date are communicated to customers; orders exceeding the quota are rejected or rescheduled (Björnsdóttir et al., 2022)	Orders exceeding capacity are rejected (avoidance); regular orders are shifted to the following date (deferral).	8 (Moderate) P2 × I4	Owner. Indicator: orders received vs daily capacity.
R03	• Packaging standards and product stacking distance • Packaging after the bread has cooled • Vehicle inspection before departure • Route and departure time with buffer time	Packaging standards and stacking arrangements have been agreed upon; third-party transport options will be prepared if the fleet encounters problems.	Packaging mitigates impact; third-party transport services shift part of the fleet risk.	6 (Moderate) P2 × I3	Person responsible for packaging and distribution. Indicator: number of damaged
R04	• Set the reject tolerance limit • Process rejected products into by-products or for internal consumption (not included in MBG orders) • Record the number of rejects per batch	Rejects per batch are recorded, and the tolerance limit is set together with the owner (10% of the batch).	Minor impacts and additional control costs exceed the benefits; risks are consciously accepted and continue to be monitored.	4 (Low) P4 × I1	Production supervisor. Indicator: percentage of rejects per batch.
R05	• Manpower requirements plan by volume and production stage • Phased recruitment with priority for local personnel • Short on-the-job training based on standard recipes and illustrated SOPs • Cross-training between stations; reserve daily personnel roster	A staffing requirements matrix is prepared for each production stage; simple illustrated SOPs are posted in the work area; new personnel are accompanied by senior staff during the initial days.	Reducing the likelihood of deficiencies and work errors through planning and training.	9 (Moderate) P3 × I3	Owner; person in charge of production. Indicator: attendance rate, number of readily available personnel.

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R06	• Basic PPE (heat-resistant gloves, apron, non-slip mat) and first aid kit • Overtime limits and work rotation • Organization of work paths and oven area • Work accident insurance protection for workers	Procurement of basic PPE and first aid kits; arrangement of the oven area and work pathway; the owner is reviewing the BPJS Ketenagakerjaan scheme for workers.	APD and spatial planning reduce probability; BPJS Ketenagakerjaan transfers the financial burden of occupational accidents.	8 (Moderate) P2 × I4	Owner. Indicators: number of work incidents, availability of PPE.
R07	• Scheduled preventive maintenance (cleaning, lubrication, oven temperature checks) • Equipment pre-production checklist • Technician and critical spare parts contact lis • Tool loan/rental agreement with partner businesses	A daily equipment checklist and service schedule were prepared; a list of technician contacts and partner bakery businesses was arranged as equipment backup.	Treatment reduces probabilities; renting/boring equipment and service contracts transfer part of the burden when equipment fails.	8 (Moderate) P2 × I4	Production manager. The indicator is equipment downtime. .
R08	• Inspection of electrical power adequacy for equipment load at the new site • Scheduling alternating equipment usage hours • Backup LPG stock • Generator rental contact	A simple check of the electrical load was carried out; equipment usage schedules were arranged alternately; backup LPG cylinders were prepared (5 cylinders).	Reducing the probability of energy disturbances through load management and reserve stock.	6 (Moderate) P2 × I3	Owner. Indicator: electrical/LPG incidents.
R09	• Periodic pest control (traps, screens, drain covers) • Daily sanitation schedule • Storage of materials in closed containers and on shelves • Daily waste management	A daily sanitation checklist is prepared; materials are stored in closed containers; the area is cleaned before and after production	Eliminating the source of contamination to decrease the probability.	4 (Low) P2 × I2	Production supervisor, indikator, sanitation checklist completion.
R10	• Dual suppliers and price comparisons • Safety stock of durable materials according to cash flow capacity • Review selling prices with partners; calculate COGS periodically	A list of at least two suppliers is compiled for main materials; prices are recorded weekly; and COGS is recalculated when material prices change.	Use dual sourcing and safety stock; absorb minor price fluctuations through margins.	9 (Moderate) P3 × I3	Purchasing officer indicator: purchase-to-reference price variance.
,R11	• Inspection upon receipt (condition, expiration date, odor, packaging) • Backup supplier • Order perishable materials D-2 • Implementation of FIFO and date labeling	The material receipt form is used; materials are labeled with the date and used according to the FIFO principle.	Inspection of acceptance and backup suppliers reduces probability and impact.	6 (Moderate) P2 × I3	Person in charge of purchasing. Indicator: percentage of materials rejected.
R12	• Standard measured recipe (grams) and scales • Per pan measurements; standard baking temperature	Standard prescription cards and scales are used, and quality sampling is performed on each batch	Standardization of processes reduces quality variation.	6 (Moderate) P2 × I3	Production supervisor, indicator: quality pass

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	and time • Quality checklist (weight, color, texture) with sampling for each batch • Recording of complaints	before packaging.			rate.
R13	• Basic personal hygiene (handwashing, head covering, mask, gloves) • Basic principles of GHP/HACCP (Codex Alimentarius Commission, 2020; Irwan et al., 2019) • Pre-packaging cooling; storage–shipping time limits; production date labeling	SOP for personnel hygiene has been prepared; the menu for MBG orders is limited to products with adequate shelf life; production date labels are applied; product liability insurance is still under evaluation.	Avoid high-risk products, enforce hygiene controls, and use insurance to transfer residual risk	5 (Moderate) P1 × I5	Owner. Indicators: SOP hygiene compliance, number of food safety complaints (target zero).
R14	• Weekly cash flow projection (cash inflows from installment payments vs. cash outflows for materials, wages, rent) • Separation of personal and business finances; reserve funds • Negotiation of down payments or payment terms	A cash flow projection template and daily cash book were prepared, and business finances were recorded separately; non-critical equipment purchases were postponed until the first payment installment was received.	Cash planning reduces the probability (reduction); non-critical expenditures are deferred until cash is available (deferral).	8 (Moderate) P2 × I4	Financial officer. Indicator: Minimum weekly cash balance.
R15	• Short-term location rental or with extension option • Gradual equipment purchase; prioritize critical equipment • Simple payback calculation • Maintain regular market (resellers, online orders) • Written agreement with partners	The limit for equipment purchases is calculated based on estimated payback; regular products continue to be marketed; written agreements with partners are recommended.	Defer large investments until demand stabilizes; diversify markets and formalize agreements.	8 (Moderate) P2 × I4	Owner. Indicator: equipment utilization ratio, share of revenue from the largest partner.
R16	• Simple form for material stock, daily production, sales, and expenses • Recipe book and COGS calculation • Weekly review by owner	The recording form was introduced and tested in the production cycle; COGS per product was calculated.	Recording reduces the probability of erroneous decision-making.	4 (Low) P2 × I2	Administrative officer. Indicator: completeness of weekly records.
R17	• Inventory of legal documentation (NIB, PIRT distribution permit, halal certificate,) • Phased administration with assistance and Food safety training for workers	A checklist of legal documents was compiled along with the status of each document.	Fulfilling the requirements reduces the probability of non-compliance.	4 (Low) P1 × I4	Owner. Indicator: percentage of complete legal documentation.
R18	• Forecasting based on previous Ramadan history • Pre-order system with down payment and deadline • Diversification of non-seasonal products	A pre-order system with a time limit was implemented for Ramadan cookies, and non-seasonal products (bread and muffins) continued to be	Pre-ordering and diversification reduce uncertainty (reduction)	6 (Moderate) P3 × I2	Owner. Indicator: Non-seasonal monthly turnover.

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	• Post-Ramadan promotions	promoted.			

Description: PIC = risk owner. Residual risk is the target after mitigation is implemented.
Source: Results of joint facilitation with partners; references in the cell refer to the bibliography.

The risk assessment revealed that the identified risks are interconnected and require integrated mitigation measures. Short deadlines (R01), orders exceeding production capacity (R02), limited skilled labor (R05), and quality inconsistencies (R12) reinforce one another, while cash flow constraints (R14) and rising material costs (R10) further limit the MSME's response capacity. Food safety risk (R13), although unlikely, remains a critical priority because of its potentially severe consequences for consumer health (Pavesi & Bragotto, 2026). In response, the assistance introduced backward production scheduling, order quotas, standardized recipes, weighing scales, quality checklists, hygiene SOPs, and production date labels. Financial and human resource controls included weekly cash flow projections, deferred non-essential equipment purchases, manpower planning, illustrated SOPs, basic personal protective equipment (PPE), and an assessment of BPJS Ketenagakerjaan protection. Particular attention was also given to investment risks and dependence on a single business partner (R15). The corresponding mitigation measures, response strategies, and residual risk targets are documented in Tables 1 and 2, which collectively constitute the risk register. These interventions reflect the importance of integrated operational, financial, human resource, and food safety controls in strengthening MSME resilience (Ciocoiu et al., 2025; De Matteis et al., 2023).

Table 3. Inherent risk map (heat map); colors indicate risk levels

Probability ↓ / Impact →	**1**	**2**	**3**	**4**	**5**
5					
4		**R04**	**R16, R18**	**R02, R05, R10, R12**	**R01, R14**
3			**R03, R09, R11**	**R06, R08, R17**	**R07, R15**
2					**R13**
1					

ISO 31000:2018 provides several risk treatment options, including avoiding risk by not initiating or continuing the triggering activity, modifying the probability, modifying the consequences, sharing risk through contracts or insurance, and retaining risk through informed decision-making (Hakimah Hamir, 2021; Hutchins, 2018). These options are mapped to five response strategies: avoidance, reduction, transfer, deferral, and retention. The term deferral is not a standard ISO option; in this study, it is defined as postponing a decision or resource commitment until prerequisite information or conditions are met, and is thus used as a practical adaptation for investment decisions and order acceptance.

Following the proposed mitigation measures, the target residual risk levels indicate a substantial reduction, with no risks remaining in the very high or high categories. Of the 18 identified risks, 14 are expected to decrease to a moderate level, while four risks (R04, R09, R16, and R17) are targeted to reach a low level. These figures represent agreed-upon targets rather than actual measurement results and therefore require verification through continuous monitoring. The business owner and designated personnel are responsible for monitoring risk indicators, including on-time deliveries, equipment downtime, product quality compliance, and minimum weekly cash balances. Very high risks are reviewed before each production cycle, high risks weekly, and medium risks monthly. The risk register is also updated

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whenever significant changes occur in order volume, production conditions, suppliers, or partner requirements, as well as when incidents or customer complaints arise. This monitoring process ensures that the risk register remains a dynamic management tool rather than a one-time document (Hutchins, 2018).

Conclusion

Risk management assistance based on ISO 31000:2018 produced the Idola Cookies SME risk register, which contains 18 risks in eight categories, with six very high risks, eight high risks, and four moderate risks. Each risk is accompanied by events and causes, probability and impact assessments, handling plans, mitigation implementation, response strategies (avoidance, reduction, transfer, deferral, retention), responsible parties, monitoring indicators, and residual risk targets. Reduction is the predominant strategy, while avoidance, deferral, and retention are selectively applied to decisions regarding order acceptance, investment, and tolerance for minor losses. The sustainability of benefits depends on regularly updating the risk register, consistently carrying out agreed mitigation, and evaluation when order volume or business conditions change.

Recommendation

First, Idola Cookies should to use the developed risk register as a practical management tool rather than merely as a documentation output. Businesses should periodically review and update their registers, particularly when production volumes, customer demand, supplier arrangements, or operational conditions change. Priority should be given to addressing the six very high and eight high-risks groups through the implementation of the proposed treatment plans. Second, relevant government institutions, particularly those responsible for MSME development, industry, and trade, are encouraged to integrate basic risk management education into their MSME development programs. Beyond conventional business training and financial assistance, these institutions should facilitate practical mentoring on risk identification, assessment and mitigation using the ISO 31000 framework. Third, future community service teams are encouraged to extend their assistance from initial risk register development to its implementation and periodic evaluation.

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