



Risks of HACCP Plan Implementation for Food Safety at Business Startup PT. BERAS JAGUNG NUSANTARA

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This study aims to ensure that business activities will be carried out in accordance with what was planned and also be able to obtain a current position of the company by the direction of company's goals and target achievement. In this study, is also influenced by the strategy we choose to achieve the goal. A company must know the amount of demand for products made by looking at market conditions and company strategy. The company's operational activities are very likely to be carried out so that the company can offer more competitive prices compared to imported products that have previously entered the market. All companies must be faced a financial and operational risks, including PT. Beras Jagung Nusantara, therefore every company needs Enterprise risk management (ERM) or enterprise risk management to overcome and reduce any company risks that may arise.

Keywords: Food Combining, ERM, Risk

1. INTRODUCTION

The number of world population affected by diabetes with worrying levels. In 2,000 the world's population suffering from diabetes has reached 171,230,000 people and in 2030 it is estimated that the number of diabetes sufferers in the world will reach 366,210,100 people or an increase of 114% in 30 years [1]. The statistical data on the number of diabetes sufferers in the world according to the WHO version in 2000 and the projected number of world diabetes sufferers in 2030 [2]. Indonesia is in the 4th place with a growth of 152% or from 8,426,000 people in 2000 to 21.257.000 people by 2030 [3]. Thus, the mining means considered by main anthropogenic activities resulting in environmental contamination with potentially toxic elements (PTE), including: arsenic (As), cadmium (Cd), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn) and zinc (Zn) with current proportional [4, 5, 6]. All of these PTEs are a risk to human health due to Inorganic As (iAs) is a highly toxic carcinogen associated with many health problems, including infertility and cardiovascular and neurological disorders [7]. Cd can cause many pathological problems such as high blood pressure, diabetes, skeletal damage and cancer [8]. In China, mining activities are predominantly carried out in rural areas. As a consequence, these activities (along with other industrial processes) have exposed populations of

rural villages to high levels of PTE (and other toxins). In 2009, a 'Google' map showing the number 100 "Cancer Villages" in China [9]. Recently, a map was published online identifying 247 "Cancer Villages" in China [10]. The negative human health impacts stemming from acute and chronic exposure to high levels of PTE are widely documented [10, 11]. Rice (*Oryza sativa* Linnaeus) is one of the world's leading food crops, with an estimated global annual production of around 480 million metric tons (base of milled rice) and is currently cultivated in over 100 countries, on every continent except Antarctica [12]. It is a staple food for more than half of the world's population, especially in Asian countries, where it provides the majority of protein intake for millions of people [13]. The total production of dietary protein per hectare is second only to that of wheat, although the yield of utilizable protein is actually higher for rice than for wheat, due to the superior quality of rice protein [14]. Corn is an ideal source of dietary fiber and phenolic antioxidants for the human diet. A number of studies support adequate dietary fiber intake to play a protective role against obese people and many other chronic diseases [15, 16]. The first step of conducting an analysis is aimed at identifying and assessing the magnitude of the impact and likelihood of operational risks occurring at PT. Nusantara Corn Rice. Based on the results of the operational risk analysis of PT. Nusantara Jagung Rice

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identified from this study consists of 14 risks from 5 operational activities. And the solution provided as an alternative action that can be taken by PT. Rice Jagung Nusantara to deal with these risks is by reducing risks. Here, Corn rice has a distinctive savory taste and is able to provide a full effect just like a rice. However, the eating a corn rice it will make your stomach not full so you will usually eat large portions. Corn rice is currently relatively more difficult to find than rice but the price is much cheaper than rice.

2. METHODOLOGY

Based on Figure 1, the following are the tester test results between Analog Corn Rice (Combining), White Rice (Single), and Red Rice (Single).



Figure 1. Comparison of the taste of corn rice (Combining) is better than brown rice (single)

Food Combining provides an option for people to get nutrition and fiber that has been packaged practically with ease of getting it. It was different and delicious taste of sensation and does not contain additives that are harmful to the body when consumed in excess. Food Combining is a solution for efforts to live healthy by the community. This is an opportunity to learn technology, so that the corn is selected according to the texture of the food to maximize its taste and not lose the taste (see Table I).

Table I. Propotion Nutrient Content Corn Rice (Combining), Brown Rice (single), and White Rice (single)

No	Nutrient Content	Corn Rice (Combining)	Brown Rice (Single)	White Rice (Single)
1.	Energy	150 kkal	110 kkal	204 kkal
2.	Carbohydrate	11,4 grams	22,78 grams	44,08 grams
3.	Fat	0,6 gram	0,89 gram	0,44 gram
4.	Fiber	0,4 gram	1,8 grams	0,6 gram
5.	Phosphor	47 mg	-	-
6.	Vitamin B2	0,04 mg	-	-
7.	Protein	6,8 grams	2,56 grams	4,2 grams
8.	Vitamin A	30 RE	-	-
9.	Vitamin B1	0,07 mg	-	-
10.	Vitamin B3	60 grams	-	-
11.	Vitamin C	3 grams	-	-
12.	Zinc	0,3 gram	-	-
13.	Calcium	2 mg	-	-

A. Company Strategy

Beras Jagung Nusantara, a company in the form of a limited liability company with capital owned by 5 people with the same share composition namely 28.6% which is located in the Citra Raya warehouse area and precisely at Jl. Biz Link Boulevard Blok L1 No. 1 Tangerang 15710 Banten, Indonesia. The company vision of Nusantara

Rice Corn "To become the best national scale company in the corn rice food industry". The company's mission is to provide natural products by utilizing modern and hygienic technology; maintain and increase the potential of employees by developing science and technology; maintain the integrity of the company chain (see Table II).

Table II. Competitive Matrix Profile PT. Beras Jagung Nusantara

Key Factor Success	Weight	PT. Beras Jagung Nusantara		SAKURA		Resteja	
		Rating	Score	Rating	Score	Rating	Score
1. Price	0,25	4	1	4	1	3	0,75
2. Taste	0,2	4	0,8	3	0,6	4	0,8
3. Distribution	0,3	3	0,9	3	0,9	4	1,2
4. Design	0,09	2	0,18	2	0,18	3	0,27
5. Technology	0,08	3	0,24	3	0,24	2	0,16
6. Packaging	0,08	3	0,24	3	0,24	2	0,16
Total	1		3,36		3,16		3,34

Table III shows PT. Nusantara Jagung Rice is able to compete with other companies and become a competent business opportunity. In addition, to measure the ability of the corn rice business by using the Internal - External Matrix (see Figure 2).

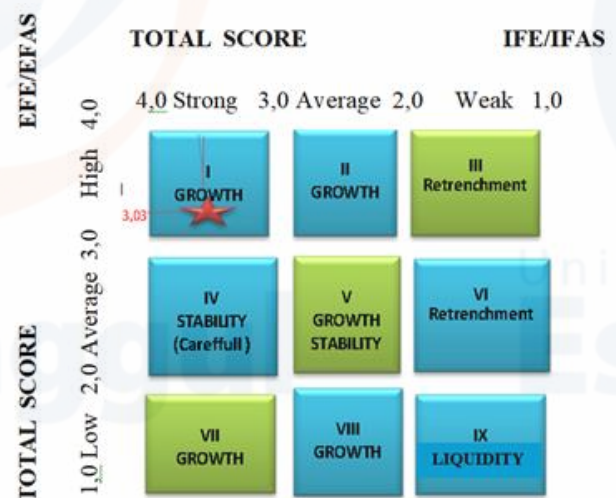


Figure 2. Internal – Eksternal (IE) Matrix

3. RESULT AND DISCUSSION

In the next step, risk management after carrying out of risk identification is to process to obtain a risk profile and conduct an assessment of exposure risk. Basically, risk assessment refers to two factors, namely: the quantity of risk and the quality of the risk. The quantity of risk is related to how much value, impact, or the exposed risk. Meanwhile, the quality of risk is related to the possibility of a risk appearing. The purpose of risk assessment is to obtain a list of risks that have been assessed for the level of impact and their likelihood of occurrence, then sorted according to the overall risk level in order to obtain the risks that need to be prioritized in handling. Then a

descriptive analysis (frequency) is carried out on the risk assessment both of the impact and the possibility to obtain the value of the impact and the possibility of a risk. The consideration used is the frequency distribution or impact assessment category or likelihood that the respondent mostly chooses or in the language of statistics better known as the mode value (see Table III).

Table III. Level and Description of Dimension Risk

Risk		
Level	Description	
1	Almost Never	Almost never happened in 5 years
2	Unlikely	1 time in 5 years
3	Possible	2 time in 2 years
4	Likely	1-4 time in 1 year
5	Almost Certain	>5 time in 1 year

The results of the risk assessment from the mode value are mapped using it to determine the main risks that are the priority of PT. Nusantara Corn Rice to be handled. The risk mapping is a continuation of the risk assessment stage, where risks are arranged according to certain groups so that management can identify the character of each risk and determine the appropriate action for each risk. The second dimension is impact, namely the level of seriousness or cost that occurs if the risks faced actually become a reality. The higher the impact of a risk, the more it needs special attention. Conversely, the lower the impact that occurs from a risk, the lower the interest of management in allocating resources to deal with the risks faced. In this study, the impact dimensions were divided into five categories, namely minor, moderate, severe, major, and worse case (see Table IV).

Table IV. Level and Description Impact Risk Dimension

Impact		
Level	Description	
1	Minor	Very Low Impact
2	Moderate	Low Impact
3	Major	Big Impact
4	Catastrophic	Very Big impact

From these two dimensions, a matrix of impacts and possible levels of priority for handling operational risks faced by PT. Nusantara Corn Rice. Impact is a possible risk impact and Likelihood Matrix, from the impact matrix and the likelihood of this risk occurring, PT. Beras Jagung Nusantara can see the level of risk to be faced, both internal and external risks, the smaller the problems faced and the smaller the risk, the smaller the handling, the greater the risk and the greater the influence on the company, the greater and prioritized handling (see Table V).

Table V. Risk PT. Beras Jagung Nusantara

No.	Input/ Step Process	Danger Identify	Rate	Unlikely	Possible	Likely	Almost Certain
1	Receipt of raw materials (rice, corn)	Destructive microbes (antitoxic) Gravel, Insects					X
2	Input good water	Heavy Metal Gravel, Insects		X		X	
3	Accept supplier (packaging, cartoon, box, crafted)	Dust, Dirt Heavy Metal Destructive microbes (antitoxic)	X	X			
4	Corn Flour	Destructive microbes (antitoxic) Heavy Metal Dust, Dirt	X				X
5	Rice Flour	Destructive microbes (antitoxic) Heavy Metal Dust, Dirt		X			X
6	Mixing Process	Dust, Dirt Gravel, Insects		X			
7	Cooling Process	Dust, Dirt Gravel, Insects Gravel, foreign object		X			
8	Extruder machine process	Dust, Dirt Heavy Metal Destructive microbes (antitoxic)		X			
9	Packing	Dust, Dirt Destructive microbes (antitoxic)	X		X		
10	Storage	Destructive microbes (antitoxic) Dust, Dirt	X				

The choice of risk treatment is carried out by taking into account the principles of cost and benefit for the company, its impact on the likelihood and impact of risks, the possibility of opportunities arising, and it is also necessary to consider the effects on other risks. In handling operational risks, there are four alternative actions that can be taken by PT. Beras Jagung Nusantara, namely: 1) Accepting Risk, is a company action to accept a risk by not taking meaningful actions requiring large resources. This action is usually applied to risks with a low (insignificant) overall risk level for a company, so that if the residual risk is handled it will cause costs that are not proportional to the benefits; 2) Avoiding Risk, is the company's action not to carry out certain business or activities that contain undesirable risks. This action is usually applied to risks whose overall risk level cannot be accepted by the company or has a very high impact on the company where its handling will cause very high and inefficient costs.

Furthermore, a reducing risk is the act of a company with all its resources trying to minimize risk optimally without eliminating the company's opportunities for profit (return). This action can be taken against at least one of the two factors, namely: 1) Reducing the likelihood of risk occurring, usually by carrying out a process of design and engineering changes, quality assurance procedures or periodic audits; 2) Reducing the impact due to the occurrence of a risk, usually applied to risks with high impact and low probability, among others by making contingency plans or evacuation plans; 3) Share Risk, is the company's action to transfer risk from the company to a third party who can manage the risk, among others, through insurance or contracting. Risk treatment is adjusted to the type of risk and the priority level of the risk. In this study, there were 14 risks that received different risk treatments (see Table VI).

Table VI. Type Risk Operational Handling PT. Beras Jagung Nusantara

Priority	Risk Event	Type Risk Handling
Level 1 (Extreme)	Raw materials & supporting materials do not match the purchase note	Reduce Risk
	Raw materials do not comply with the specified standards	Reduce Risk
	The raw material for water does not comply with the specified standards	Reduce Risk
	Stock no accurate	Reduce Risk
	Rice and corn are damaged by contamination and micrology and spoilage occurs	Reduce Risk
Level 2 (High)	The raw materials for rice and corn do not comply with the specified standards	Reduce Risk
	Auxiliary material not according to standard	Reduce Risk
	Storage and placement of goods according to location	Reduce Risk
	Incorrect dosage	Reduce Risk
	Miss press lid	Reduce Risk
Level 3 (Medium)	Plastic package is not filled	Reduce Risk

Based on Table 7 above, the type of risk management for PT. Rice Jagung Nusantara is level 1, this is because the raw material is the source of the production process which is important in analog corn rice product.

4. CONCLUSION

Based on data collection and processing and analysis carried out, several conclusions are obtained, namely the risk of raw materials and auxiliary materials not according to the purchase note as a result of urgent requests without PO the wrong addressing of raw materials and auxiliary materials with delivery via ETA (estimation time arrival). determined, the PO number stated in the road certificate is not appropriate and the quantity or name of the goods does not match the travel certificate. The risk of rice and corn raw materials not

conforming to the determined standards due to weak QC Incoming receipt which results in non-standard sizes, raw materials and exposure to metals and microbiology as well as foreign flavors; the risk of water raw materials not conforming to the determined standards due to weak controls causing water to smell, become cloudy, and contain dissolved substances that exceed the predetermined threshold values; the risk of inaccurate stock due to the occurrence of human errors, incorrect input quantity of goods, and the receipt of incorrect identification of the item code. The risk of rice and not being damaged due to contamination and microbiology and rotting as a result of leaking stainless tubs, dirty stainless tubs, water temperature of not reaching 100 ° C, and storage time not reaching the minimum length of time; The risk of raw materials not conforming to the determined standards due to expired goods coagulation (clumping) and contamination with other materials; risk of raw material not according to the determined standards due to the physical condition of sugar containing water, non-standard granular size, risk of non-standard auxiliary material due to non-PP plastic (polypropylene), cardboard not made from 150 kraft, non-standard size of auxiliary material, and the auxiliary material form is not standard; the risk of storing and placing goods according to location as a result of the placement of goods not in accordance with the location and multi-location documentation not being stored properly; risk of raw materials not conforming to determined standards due to rice and corn, non-standard sizes, exposure to metals and microbiology and foreign flavored fruits; the risk of corn rice not in accordance with the determined standards incomplete mixtures, resulting in clumping; risk of improper dosing due to volume control not working properly, hose clogging; risk of miss press lid, due to heater break, temperature too hot, lid position shift and error in PLC program; the risk of corn rice plastic packaging not being filled.

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