

## MAPPING IDEA &amp; LITERATURE FORMAT | RESEARCH ARTICLE

# The Influence of Labor and Raw Material Volume on Tofu Production in Micro-Enterprises in Sidodadi Village

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## ABSTRACT

Micro-enterprises engaged in tofu production in Sidodadi Village, Asahan Regency, play an important role in supporting the local economy. However, these enterprises often encounter challenges in optimizing key production factors, particularly the availability of labor and raw materials. The core issue of this study is to determine how far these two factors influence the level of tofu production. This research aims to analyze the effect of the number of workers and the volume of raw materials on tofu production among micro-enterprises in the region. A quantitative method with multiple linear regression analysis was applied, supported by data collection through observation, interviews, and questionnaires distributed to business actors and workers. The results revealed that both labor and raw materials have a significant partial and simultaneous effect on tofu production volume. The F test confirmed the model's feasibility ( $F = 69.238$ ,  $\text{Sig.} = 0.000$ ), while the t test showed that each independent variable significantly affected production ( $\text{Sig.} < 0.05$ ). The Adjusted  $R^2$  of 0.064 indicates that 6.4% of the variation in tofu production can be explained by the two variables. These findings imply that improving labor efficiency and managing raw material availability are essential strategies for enhancing productivity and strengthening the economic empowerment of micro-enterprises in Sidodadi Village.

**Keywords:** Labor, Raw Materials, Tofu Production, Micro-Enterprises, Sidodadi Village.

## I. Introduction

Micro-enterprises play a crucial role in the economic structure of Indonesia, particularly in rural areas. These small-scale businesses serve not only as the main source of livelihood for many households but also as key drivers of local and national economic development. In the context of rural economies, micro-enterprises contribute to income generation, poverty alleviation, and job creation, especially in regions where access to formal employment opportunities remains limited. Moreover, micro-enterprises help fulfill local consumption demands and offer products and services that are essential to the daily needs of surrounding communities. Among the various types of micro-enterprises that thrive in rural Indonesia, traditional food processing businesses are among the most common and resilient. These enterprises often rely on locally available raw

materials and inherited knowledge that has been passed down through generations. One notable example is tofu production, a soybean-based food product that holds a prominent place in Indonesian culinary culture. Tofu is favored not only for its affordability but also for its high nutritional value, particularly its protein content. Its versatility allows it to be used in a wide range of dishes, from simple home-cooked meals to commercial food products sold in markets and restaurants.

In this regard, Sidodadi Village, located in Asahan Regency of North Sumatra Province, represents a significant local hub for household-scale tofu production. The majority of tofu production activities in this village are carried out by local families using traditional methods and relatively simple equipment. These micro-enterprises are deeply integrated into the local economy, not only meeting the food needs of the community but also creating employment opportunities and stimulating rural economic activity. Despite being small in scale, the tofu industry in Sidodadi has a substantial socio-economic impact, contributing to both household welfare and community development. Nevertheless, despite its important role and steady demand, tofu production in Sidodadi Village still faces a number of challenges, particularly concerning production efficiency and operational management. Many micro-entrepreneurs in the area rely heavily on manual labor, and their decisions related to production are often based on habits or traditional practices rather than systematic planning or data-driven analysis. This lack of analytical approach often leads to inefficiencies in resource utilization, including labor and raw materials, which in turn affects productivity, product quality, and the long-term sustainability of the business.

Two key factors that directly affect the output of tofu production are the number of laborers involved in the production process and the volume of raw materials used—specifically, soybeans. The tofu-making process is labor-intensive and involves several stages, such as soaking, grinding, boiling, filtering, and molding. Each stage requires time, physical effort, and coordination. Therefore, the availability and productivity of labor significantly influence the quantity and quality of tofu produced. At the same time, the amount and quality of soybeans used determine the production capacity and the nutritional value of the final product. A lack of balance between these two inputs—labor and raw materials can result in reduced efficiency and even financial loss. Micro-enterprises (UMKM) play an essential role in Indonesia's economic structure, particularly within rural communities. These small-scale, often family-run businesses function not only as sources of livelihood but also as vital contributors to poverty reduction, income generation, and local economic resilience (Tambunan, 2019). In rural areas, where formal employment opportunities are limited, micro-enterprises frequently act as the backbone of community welfare and sustainability. Among the various types of micro-enterprises, traditional food-processing businesses stand out for their resilience and cultural embeddedness. These enterprises typically rely on local resources and inherited production skills passed down through generations. One prominent example is tofu production, which occupies an important place in Indonesian culinary culture. Tofu is highly valued for its affordability, versatility, and high nutritional content, particularly protein, making it a staple food across socio-economic groups (Suhartini & Pratiwi, 2020).

Sidodadi Village, located in Asahan Regency, North Sumatra, has long been recognized as a hub for tofu micro-enterprises. Most production activities in the village are household-based, using traditional, labor-intensive methods with minimal technological support. Despite their relatively small scale, these tofu businesses contribute significantly to the local economy by providing employment, meeting food needs, and stimulating rural economic activity. However, they continue to face structural challenges, particularly in achieving production efficiency and sustainability. Decisions regarding resource allocation—such as how many workers to employ or how much soybean to purchase—are often based on tradition or intuition rather than systematic planning, leading to inefficiencies in resource use. Two critical factors that directly determine tofu output are labor availability and raw material volume. Tofu production involves multiple stages: soaking, grinding, boiling, filtering, pressing, and molding—each of which requires coordinated labor input. At the same time, soybeans, as the primary raw material, directly determine production capacity and product quality. An imbalance between these two inputs frequently leads to inefficiencies such as underutilized labor, wasted soybeans, or reduced product quality.

Although several studies have examined production factors in tofu industries across Indonesia (e.g., Tarigan, 2022; Azizah & Setiaji, 2021), most have focused on small- to medium-scale enterprises that are relatively more structured and better resourced than household-based micro-enterprises in rural settings. As a result, findings from these studies may not fully capture the dynamics of household-scale tofu producers, who rely almost entirely on manual labor and operate under resource and market constraints. Furthermore, while prior research has highlighted the role of managerial capacity (Azizah & Setiaji, 2021), few studies have quantitatively analyzed the specific effects of labor and raw material allocation in purely household-based contexts such as Sidodadi Village. This represents a clear research gap in the literature: there is limited empirical evidence on how labor quantity and raw material volume interact to shape tofu production in rural micro-enterprises operating under traditional, resource-constrained conditions. Addressing this gap is crucial, as such enterprises form the majority of Indonesia's rural economy and directly influence household welfare and food security.

The novelty of this study lies in its focus on quantifying the relative influence of labor and raw material inputs in a household-based, rural tofu industry, a context that is often overlooked in prior research dominated by studies of larger or more modern enterprises. By employing a quantitative research approach with regression analysis, this study aims to provide empirical evidence tailored to the realities of Sidodadi Village. The contributions of this research are twofold. Practically, it provides local tofu producers with data-driven insights to optimize labor and raw material use, thereby enhancing productivity, efficiency, and profitability. Theoretically, it enriches the existing literature on micro-enterprise production by extending empirical analysis into rural, traditional food-processing industries where data are scarce. This study also builds on prior works (Tarigan, 2022; Azizah & Setiaji, 2021) by testing their propositions in a less formalized, more resource-constrained context. In conclusion, this research seeks to answer a central question: To what extent do labor quantity and raw material volume influence tofu production in household-based micro-enterprises in Sidodadi Village? By addressing this question, the study not only fills a significant gap in the literature but also provides actionable recommendations for practitioners and policymakers aiming to strengthen the role of rural micro-enterprises in Indonesia's economic development.

## II. Literature Review and Hypothesis Development

(Tarigan, 2022) investigated the impact of labor and raw materials on tofu production in a tofu processing factory in Timbang Galung, Pematangsiantar. Using quantitative methods, including multiple linear regression, the study found that both labor and raw materials positively and significantly influenced tofu output. The regression model showed a high adjusted  $R^2$  of 0.700, indicating that 70% of production variation was explained by these two variables. (Azizah, 2021) Similarly, Azizah and Setiaji (2021) explored raw materials, labor, and managerial ability on tofu production in Adiwerna Village, Tegal. Their study revealed that these factors had a significant simultaneous effect, accounting for 59.1% of production variance. Individually, raw materials contributed 14.67%, labor 16.31%, and managerial ability 7.73%

Revi & D. S., Syahni (2020) conducted a study in Padang, applying a Cobb-Douglas production function. They found that raw materials, labor, working hours, and grinding machinery all had significant positive effects on tofu production, with an exceptionally high  $R^2$  of 96.7%, showing excellent explanatory power. Joseta Faperta Unand. In a different context, Prima, Harahap, & Prima (2019) examined the demand for soybeans in small and home tofu industries in Semarang Regency. They identified soybean demand as being inelastic, with drivers including tofu prices, labor costs, and demand levels. Additionally, the study confirmed the feasibility of these home-based tofu enterprises (using BEP, R/C,  $\pi/C$  analyses). Harahap and Prima (2019) assessed the effects of raw material costs, direct labor costs, and overhead costs on production increases in small tofu and tempe industries in Batam. Their findings pointed to significant individual and collective impacts of these cost variables on production output.

Collectively, these studies affirm that labor, whether in terms of quantity, productivity, or cost and raw material availability (and cost), is consistently a critical determinant of tofu production output. The

exceptionally high  $R^2$  values (particularly in the Padang and Pematangsiantar studies) underscore the substantial influence of these inputs. What remains less explored, however, is the specific interplay of these factors in micro enterprises operating under highly manual, household-scale conditions as found in rural settings like Sidodadi Village. Additionally, previous research often omits the inclusion of managerial skill or process-specific interventions in explaining production variance, although Azizah & Setiaji's study suggests this could be another relevant dimension.

The literature review in this study begins with the understanding that micro-enterprises in Indonesia play a vital role in sustaining the national economy, particularly in rural areas. A micro-enterprise is a productive business unit managed by individuals or families with limited capital, a relatively small number of workers, and typically relying on simple technology. The presence of micro-enterprises not only contributes to job creation but also plays a role in income distribution and poverty alleviation. In this context, traditional food-processing industries such as tofu production represent a relatively stable sector due to consistent market demand and the affordability of their products for a broad segment of the population. Tofu production in Indonesia is still largely carried out at a household scale using simple equipment and traditional techniques passed down through generations. The production process involves several stages, including soaking soybeans, grinding, boiling, filtering, coagulating, and molding. Each of these stages requires careful coordination between the availability of raw materials, the labor force, and efficient use of working time. Due to its labor-intensive nature, the labor factor has a significant influence on production continuity. The quantity of labor determines the daily production capacity, while the quality of labor, including skill, experience, and working speed, affects process efficiency and the final product's quality.

Raw materials, in this case soybeans, are the primary production factor determining the volume and quality of tofu produced. High-quality soybeans result in tofu with a firm texture, better flavor, and optimal nutritional value. Conversely, using low-quality soybeans will yield products less favored by consumers and reduce competitiveness in the market. In Indonesia, most soybeans for tofu production are imported, meaning their prices are affected by fluctuations in currency exchange rates, international trade policies, and global market conditions. This creates a particular challenge for small-scale tofu producers, as raw material costs often account for the largest portion of total production costs. Production theory in economics explains the relationship between inputs and outputs, where inputs include factors such as labor, raw materials, capital, and technology. One commonly used production function is the Cobb-Douglas model, which assumes that output is influenced by the usage level of each input, and that at a certain point, additional output will diminish — the law of diminishing returns. In the context of household-scale tofu industries, the relationship between labor quantity and raw material volume with production output is especially relevant for analysis because these two variables are the dominant and most easily measured inputs.

Findings from previous research consistently emphasize the importance of labor and raw materials in determining tofu production volumes. Tarigan (2022) conducted a study in a tofu processing factory in Timbang Galung, Pematangsiantar, and found that both labor and raw materials had a positive and significant effect on production, with an adjusted  $R^2$  value of 0.700, meaning 70% of the variation in production could be explained by these two variables. Similarly, Azizah and Setiaji (2021) in Adiwerna Village, Tegal, found that raw materials, labor, and managerial ability had a significant simultaneous effect on tofu production, with individual contributions of 14.67% for raw materials, 16.31% for labor, and 7.73% for managerial ability, jointly explaining 59.1% of production variance. (Revi and Syahni 2020) Padang applied a Cobb-Douglas production function and found that raw materials, labor, working hours, and grinding machinery all had significant positive effects on tofu production, achieving an exceptionally high  $R^2$  of 96.7%. Prima, Harahap, and Prima (2019) in Semarang Regency focused on soybean demand in small and home-based tofu industries and found that soybean demand was inelastic to price, influenced by tofu prices, labor costs, and demand levels. They also confirmed the financial feasibility of home-based tofu enterprises through break-even point, R/C ratio, and profit-cost ratio analyses.

Harahap and Prima (2019) studied small-scale tofu and tempe industries in Batam, emphasizing production cost components, and found that raw material costs, direct labor costs, and overhead costs each

had a significant effect on production increases, both individually and collectively. These findings reinforce the view that labor and raw materials are the main determinants of tofu production, regardless of location or scale differences.

Research on production factors in tofu industries has largely concentrated on small- to medium-scale enterprises, which typically operate with more structured management systems and larger production capacities. In contrast, household-scale micro-enterprises in rural areas remain underexplored, especially those that rely entirely on manual processes. In Sidodadi Village, Asahan Regency, tofu production is still carried out using traditional methods without modern machinery, making the influence of labor and raw material inputs potentially different from findings in larger-scale contexts. Previous studies, such as Azizah and Setiaji (2021), indicate that managerial ability also plays an important role in production outcomes, covering skills such as scheduling, raw material inventory management, and task allocation. However, many studies have not explicitly incorporated managerial factors into production models. In household industries, managerial responsibilities usually rest on the owner, which may create variability in efficiency and productivity. From both theory and prior empirical evidence, a conceptual framework emerges that places labor quantity and raw material volume as key independent variables influencing tofu production. Labor quantity is expected to increase output capacity by enabling more tasks to be performed within the same timeframe, while raw material volume directly influences production continuity by ensuring sufficient soybean availability. Nevertheless, balance is crucial—excess labor without sufficient raw materials may cause inefficiencies, while abundant raw materials without adequate labor may lead to delays and reduced product quality.

The principle of diminishing marginal returns is also relevant. In micro-enterprises with limited space, tools, and technology, increasing labor or raw materials beyond a certain point may not proportionally increase output. For example, hiring additional workers in a cramped production area can reduce efficiency, while insufficient labor in the face of abundant raw materials can lead to spoilage. Raw materials also carry unique risks, as they are directly transformed into tofu and are heavily influenced by market fluctuations and external supply chains. Labor, on the other hand, is more flexible but highly variable in skill and availability, often sourced from family or community members. These complexities highlight the need for empirical research in contexts like Sidodadi Village, where tofu production remains highly traditional and constrained. This study adopts a quantitative approach using multiple linear regression analysis because the research objective is to measure and test the statistical significance of relationships between labor, raw materials, and tofu production. The focus on numerical data allows for objective evaluation of hypotheses and provides actionable insights for local micro-entrepreneurs.

The choice of Sidodadi Village as the research site is based on its prominence as a center of tofu micro-enterprises in Asahan Regency, where most producers still operate at a household scale. Data were collected through structured questionnaires, interviews, and documentation. Closed-ended questions were used to ensure comparability across respondents, while documentation involved production records such as daily output logs, raw material purchase receipts, and worker schedules. The study employed a saturation sampling technique, with 25 respondents representing the total population of tofu micro-enterprises in the village. Although this number may appear small, it reflects the entire population in the study area, thereby minimizing sampling bias. Operational definitions of the variables were established to ensure clarity. Labor quantity refers to the number of active workers involved in daily tofu production. Raw material volume refers to the amount of soybeans (in kilograms) used in the production process. The dependent variable, tofu production, is measured in kilograms of finished tofu produced per day. No additional control variables were applied in this study, although factors such as managerial ability and technology use are acknowledged as possible influences outside the model.

Based on the above framework, the following hypotheses are proposed:

*H1: The number of workers has a significant effect on tofu production.*

*H2: The volume of raw materials has a significant effect on tofu production.*



*H3: The number of workers and the volume of raw materials simultaneously affect tofu production.*

This research contributes by addressing a clear gap in the literature: quantifying the relative influence of labor and raw material inputs in a rural, household-based tofu production context. The findings are expected to provide practical guidance for micro-enterprises in Sidodadi Village to optimize resource allocation, improve efficiency, and strengthen their role in local economic empowerment.

### III. Research Methodology

#### 3.1. Types and Approaches of Research

This research employs a quantitative approach with an associative research design, aiming to determine the influence of two independent variables, labor quantity and raw material volume, on the dependent variable, tofu production. The quantitative method is chosen because it enables the use of numerical data and statistical techniques to test predetermined hypotheses and generate objective, measurable results. This approach is particularly appropriate for assessing cause-and-effect relationships between variables in small-scale production contexts.

#### 3.2. Research Location and Time

This study was conducted in Sidodadi Village, Kisaran Barat Subdistrict, Asahan Regency, North Sumatra Province, which is known as a hub for household-scale tofu production. The location was selected based on its active micro-industry activities, accessibility, and willingness of local producers to provide relevant data. Tofu businesses in this area typically use manual labor and basic tools, offering a realistic setting to examine production efficiency challenges. The research was conducted from July to August 2025, covering field observations, interviews, data collection, and statistical analysis. This period was chosen to reflect regular production conditions following the post-Eid market, although seasonal factors such as increased demand during festive periods are acknowledged and considered in data interpretation.

#### 3.3. Population and Sample

The population in this study consists of all production workers employed in tofu micro-enterprises located in Sidodadi Village. Based on field observations and owner records, approximately 75 workers are actively engaged in various tofu businesses in the area. The sampling technique used is saturated sampling (total sampling), in which all accessible members of the population relevant to the study are included. A total of 25 workers who were directly involved in daily tofu production were selected as the sample. Although this method allows for comprehensive data collection in small populations, potential representativeness bias is addressed by ensuring diversity in job roles and levels of experience within the sample. Demographic data collected includes age, gender, education level, and years of service, which may influence production performance and are considered in the analysis.

#### 3.4. Research Variables and Operational Definitions

This study employs three main variables: two independent variables and one dependent variable. The first independent variable ( $X_1$ ) is the number of workers, which refers to the total number of individuals directly involved in the tofu production process each day. This variable is measured in terms of persons and represents the labor input contributing to production activities. The second independent variable ( $X_2$ ) is the volume of raw materials, defined as the total amount of soybeans used in daily production, measured in kilograms (kg). This variable captures the material input that directly affects the quantity of tofu produced.

The dependent variable (Y) in this study is the tofu production output, which indicates the total amount of tofu produced per day. This output is measured either in kilograms or in units, depending on the production standard applied by each tofu enterprise. In addition to these primary variables, several control variables—such as equipment capacity, working hours, and worker experience—were also observed during data collection. However, these were not included in the regression model. Their potential influence on production efficiency is acknowledged, as they may contribute indirectly to variations in tofu output but fall outside the primary focus of this analysis.

### 3.5. Data Collection Techniques

Data were collected using four main techniques:

- a. Structured Interviews: Conducted with tofu business owners and managers using standardized questions about the number of workers, soybean usage, and daily tofu output.
- b. Direct Observation: The Researcher directly observed production activities for three consecutive days, recording workers, raw material usage, and output levels.
- c. Documentation Review: Collected secondary data from business records such as purchase logs, attendance sheets, production reports, and sales receipts.
- d. Closed-Ended Questionnaire: Used to gather quantitative data on key variables, including daily soybean usage and tofu output per production cycle.

### 3.6. Data Analysis Techniques

The data obtained were analyzed using multiple linear regression analysis to determine the simultaneous and partial influence of the number of workers and the volume of raw materials on the amount of tofu production.

The regression model used is:

- a. Multiple Linear Regression

To calculate the accuracy of the relationship between the labor variables (X1) and raw materials (X2) together with production (Y), the following analysis is used:

$$Y = a + b_1X_1 + b_2X_2$$

Where:

- Y = Production Variables
- a = Constant/Y intercept
- b<sub>1</sub> = Labor Force Regression Coefficient (X<sub>1</sub>)
- b<sub>2</sub> = Raw Material Regression Coefficient (X<sub>2</sub>)
- X<sub>1</sub> = Labor Capacity Variable
- X<sub>2</sub> = Variable Raw material

Statistical tests used include:

- 1) F test(simultaneous) to test the influence of variables X<sub>1</sub> and X<sub>2</sub> together on Y.
- 2) t-test(partial) to test the influence of each independent variable on the dependent variable.
- 3) Coefficient of Determination (R<sup>2</sup>) to find out how much the independent variable contributes to the dependent variable.

## IV. Results and Discussion

### 4.1. Research Results

As a center for micro-enterprises in Asahan Regency, Sidodadi Village houses several tofu-processing businesses that play an essential role in the local economy. However, these enterprises still face challenges in resource management, particularly in terms of labor and raw materials. These two input factors directly affect the continuity of the tofu production process, which includes soybean soaking, grinding, boiling, filtering, coagulating, molding, and packaging. This study was conducted to measure the extent to which labor quantity and raw material volume affect tofu production volume. A quantitative approach was applied, using primary data collected through field observations, structured interviews, and closed questionnaires. Multiple linear regression analysis was used to test the hypothesis. Sidodadi Village was chosen as the research site because of its growing tofu industry and strategic location near local markets. Nonetheless, several constraints—such as soybean price volatility, limited capital, and lack of skilled labor remain prominent. This study contributes to the literature by offering empirical evidence from rural micro-enterprises and emphasizing the importance of integrating production factors in local food processing industries.

#### a. Simultaneous Test (F Test)

The F-test was conducted to examine the joint effect of labor and raw materials on tofu production. The results are summarized in the table below:

**Table 4.1 Simultaneous Test (F Test)**

| Model      | Sum of Squares | df | Mean Square | F      | Sig.  |
|------------|----------------|----|-------------|--------|-------|
| Regression | 358,487        | 2  | 179,243     | 69,238 | 0.000 |
| Residual   | 56,953         | 22 | 2,589       |        |       |
| Total      | 415,440        | 24 |             |        |       |

Based on the results in Table 4.1, it can be seen that the calculated F-value ( $F_{\text{calc}} = 69.238$ ) is greater than the F-table value ( $F_{\text{table}} = 3.112$ ) and the significance value (p-value = 0.000) is smaller than the significance level of 0.05. Therefore, the null hypothesis ( $H_0$ ), which states that labor and raw materials do not simultaneously affect tofu production, is rejected. This finding confirms that labor and raw materials jointly have a statistically significant effect on tofu production volume.

#### b. Partial Test (t-Test)

The t-test results for each independent variable are presented below:

**Table 4.2 Partial Test (t-Test)**

| Variable             | t-Value         | Sig.  | Interpretation |
|----------------------|-----------------|-------|----------------|
| $X_1$ : Labor        | 238,741,538,401 | 0.000 | Significant    |
| $X_2$ : Raw Material | 95,159,194,913  | 0.000 | Significant    |

Based on the results in Table 4.2, it is shown that the t-value for labor ( $t_{\text{calc}} = 23.874$ ) and raw materials ( $t_{\text{calc}} = 9.516$ ) are both greater than the t-table value ( $t_{\text{table}} = 2.074$ ). Moreover, the significance values (0.000) are smaller than the significance level of 0.05. Therefore, the null hypotheses ( $H_0$ ) are rejected for both variables. This indicates that labor ( $X_1$ ) and raw materials ( $X_2$ ) each have a significant partial effect on tofu production volume.

#### c. Coefficient of Determination ( $R^2$ and Adjusted $R^2$ )

The t-test results for coefficient of determination are presented below:



**Table 4.3 Coefficient of Determination ( $R^2$  and Adjusted  $R^2$ )**

| Model | R     | R Square | Adjusted R Square | Std. Error |
|-------|-------|----------|-------------------|------------|
| 1     | 0.377 | 0.142    | 0.064             | 4.02515    |

Based on the results in Table 4.3, the adjusted  $R^2$  value is 0.064 (6.4%). This means that labor quantity and raw material volume together explain only 6.4% of the variance in tofu production volume. The remaining 93.6% of the variance is influenced by other factors outside the model, such as machinery, technology, time management, or operational strategies.

#### 4.2. Discussion

##### a. The Effect of Labor on Tofu Production

The results of the t-test indicate that labor has a statistically significant effect on tofu production. This finding is consistent with the study by Begalung and Padang (2021), which emphasized that labor efficiency and quantity are major contributors to the performance of micro-enterprises. In Sidodadi Village, most tofu processing activities are carried out manually, requiring direct involvement of workers at every stage. Well-trained laborers can improve processing speed and reduce production errors, thereby increasing output and ensuring consistency. In contrast, insufficient or unskilled labor can lead to inefficiencies, declining quality, or production delays. The implication is that micro-enterprise managers must improve labor planning, including recruitment based on workload, on-the-job training, and performance-based incentives to increase labor productivity.

##### b. The Effect of Raw Material Volume on Tofu Production

The t-test also revealed a significant effect of raw material volume—specifically soybeans—on tofu production. This aligns with the findings of Yuliana and Ardiansyah (2023), who stated that the availability and quality of raw materials are critical to maintaining production continuity and explaining quality. Tofu production depends heavily on a steady and sufficient supply of soybeans. Inconsistent supply, often due to external market fluctuations or supplier dependency, can cause production delays or volume drops. In this context, raw material planning and procurement must be optimized, possibly through local sourcing networks or cooperative purchasing systems.

##### c. The Joint Effect of Labor and Raw Materials

The F-test confirms that both labor and raw materials jointly affect tofu production significantly. However, the relatively low adjusted  $R^2$  suggests that these variables alone cannot fully produce outcomes. This is in line with Suryani et al. (2020), who argue that factors such as equipment reliability, technology adoption, managerial competence, and production planning also play crucial roles in determining productivity in micro-enterprises.

## V. Conclusion

Labor has a significant partial impact on tofu production volume. The greater the number and quality of workers, the more efficient the production process and the higher the yield. Raw materials also have a significant partial impact on tofu production volume. The availability of sufficient and high-quality raw materials, particularly soybeans, is a key factor in ensuring smooth production and product quality. Simultaneously, labor and raw materials significantly influence tofu production volume in Sidodadi Village. This is demonstrated by an F-test with a significance value of 0.000 and a determination value of 59.9%, indicating a significant contribution of both variables in influencing production output. The coefficient of determination of 6.4% indicates that the labor and raw material variables explain a small part of the variation in production volume, while the remainder is influenced by other factors such as production management,

use of technology, market conditions, and internal business policies. From these results, it is recommended that micro-business actors can manage their workforce more efficiently and plan raw material procurement more carefully to increase production capacity and product competitiveness in the local market.

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