



## Market Structure of the Tofu Agroindustry

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### Abstract

Tofu is an easily accessible and cheap source of vegetable protein. The tofu industry in Kota Kefamenanu District is experiencing quite rapid development. This research aims to determine the market structure of the tofu industry in Kota Kefamenanu District. The sample was determined using a saturated sampling technique of 7 tofu industrial business units in the Kefamenanu City sub-district which includes villages (Tubuhue, Sasi, South Kefa, Maubeli and Central Kefa). The data analysis method used is a qualitative descriptive method, Market Structure (Market Share, Concentration Ratio, Herfindahl Hirschman Index). Based on the research results, the market structure of the tofu industry in the Kota Kefamenanu sub-district is known to be controlled by a large market share with the highest level of market share control (MS) in UD. Sumber Hidup with a value of 23.9 %, while the lowest market share (MS) in the alpha omega industry has a value of 4.2%. Research on the concentration ratio of three companies (CR3) produces a tofu industry value of 60.6 %, so it can be seen that the value is  $0.4 \leq CR3 \leq 0.8$ . Meanwhile, from the results of the Herfindahl Hirschman Index calculation, a value of 1735.4 % was obtained, meaning that the IHH value ranges between 1000-2500 or  $0 < IHH$ , so the tofu industrial market in Kota Kefamenanu District is in the Oligopoly market type.

**Keywords:** Agroindustry, kefamenanu, market structur, tofu

### A. Introduction

Agriculture is a *prime mover* (main driver) because the agricultural sector supports other sectors such as industry and services. One form of support is by providing raw materials for the processing industry. A form of industry that is easily found on a large and small scale is agro-industry which processes various raw materials *into* semi-finished materials and ready-to-consume products.

Agroindustry provides added value through processing processes. One agro-industry that has the potential to be developed in Kota Kefamenanu District, Kefamenanu Regency is the tofu agro-industry. The tofu agroindustry is an agroindustry that uses soybeans as raw material because the amount of soybeans imported is always available and there is also sufficient labour (Arifin, 2014). However, there are still shortcomings, including capital, expert personnel, raw materials and infrastructure. Tofu has quite high nutritional value, the same as other proteins such as meat and fish. The reason why the people of North Central Timor Regency (TTU) like to consume tofu is apart from its nutritional value, namely that the people of TTU are still classified as low income and the rate of malnutrition (*stunting*) is still high at 46.7 per cent, so tofu is one of the foods that are affordable for fulfilling nutrition. community (Tasik et al., 2020 ; BKKBN NTT Province, 2021).

Data was obtained from Kota Kefamenanu District according to the publication of BPS (Central Statistics Agency) Kab. TTU in 2018, with a total of 9 sub-districts, sub-districts (Maubeli, Sasi, Badanue, South Kefa, Benpasi, Bansone, Central Kefa, Aplasi, North Kefa). The number of small food industry businesses is 50 units, including 8 units of tofu businesses in Kefamenanu City District, namely, 1 unit in Sasi Village, 1 unit in Badanue Village, 1 unit in South Kefa Village, 2 units in Central Kefa, and 2 units in Marbella Village.

This data shows that many food processing industry businesses provide various foods made from tofu, in addition to those that sell in retail form. Tofu marketing shows promising prospects so it needs to be supported by continuous and quality tofu production (Umar Burhan et al., 2011). Tofu as a source of vegetable protein is a substitute product for animal protein from meat and fish whose price is relatively high for the residents of Kefamenanu City District, most of whom are dominated by students with middle-income levels, so tofu is a popular source of protein. The availability of a large market will result in competition, competitors also come from similar entrepreneurs around Kota Kefamenanu District. In general, the tofu-making business is a home industry and is very popular with consumers from both the upper and lower classes (Arifin, 2014). There are quite a lot of home industry entrepreneurs in Kota Kefamenanu District. The tofu industry in Kota Kefamenanu District is spread across 5 sub-districts which have 7 small tofu industry businesses. Looking at the promising market segment and the large number of consumers, the possibility of increasing the tofu industry continues to increase. This has a very positive influence, but with so much competition, the question arises of how tofu industry players create their market structure, and what factors influence the market structure of the tofu industry in Kota Kefamenanu District.

## B. Methodology

The research was census-based, where all tofu industrial businesses in Kota Kefamenanu District were sampled. Primary data related to total production and marketing area. Data collection through interviews using a prepared list of questions. Secondary data was obtained through literature studies at the TTU Regency Industry and MSME Service, the Kefamenanu City District Office, and the TTU Regency BPS. Based on survey results in Kota Kefamenanu District, there are 7 tofu industrial units. For analysis purposes, the seven agro-industries were taken by census and used as respondents (Sugiyono, 2007). The census method is used to be more objective, to obtain detailed results regarding the structure of the tofu market.

Descriptive analysis is used by tabulating the interview data which is then grouped and presented as a percentage based on the number of respondents using the *Frequency analysis table*. There are several ways to observe the relationship between structure, namely market share, concentration ratio and *the Herfindahl Hirschman Index*, and also added productivity analysis (Sari et al., 2022; Hasibuan, 1993).

## Industrial structure

The first approach used is *Market Share Theory*, which explains the amount of market share control a business has. This *Market Share* approach can be described using the following formula according to Arini & Sugiyanto, (2013) :

$$M.S = \frac{S_i}{S_{tot}} \times 100\% \dots\dots\dots(1)$$

Information:

- M.S : Market share of a marketing agency (%)
- S<sub>i</sub> : the number of sales of the i-th marketing agency
- S<sub>tot</sub> : total sales of all marketing agencies

## 2. Concentration Ratio Method

The concentration ratio *is* used to measure the proportion of the total sales in the industry based on the largest companies. The concentration ratio method used in this research is CR-3 ( *concentration ratio-3* ). This method according to Lipczynski and Wilson (2001) is:

$$CR_3 = \sum_{i=1}^n S_{ij} \dots\dots\dots (2)$$

Information:

CR<sub>3</sub>: concentration ratio of 3 companies (%)

S<sub>1</sub>: percentage of market share (%).

n: the total number of companies in the industry.

Criteria:

1. CR<sub>3</sub> < 0.4 means the market structure is perfect competition or monopolistic competition.
2. 0.4 ≤ CR<sub>3</sub> ≤ 0.8 then the market structure is oligopoly.
3. CR<sub>3</sub> > 0.8 means the market structure tends to be a monopoly.

-Hirschman Index

The Herfindahl - Hirschman Index is an approach that refers to the market structure that occurs in a business, the industrial concentration of a business in a market. Calculations are carried out using the formula (Sari et al., 2022)

$$HHI = \sum_{i=1}^n MS_i^2 \dots\dots\dots (3)$$

Information:

IHL : Herfindahl-Hirschman index( %)

MSi : with company market share (%)

n : the total number of companies in the industry

Criteria:

1. IHH = 1, then the market leads to a monopoly.
2. IHH < 0, then the market leads to perfect competition.
3. 0 < IHH < 0.999, then the market leads to an oligopoly.

## C. Findings and Discussion

### Analysis of the market structure of the Tofu Industry in Kota Kefamenanu District

Analysis of the structure of the tofu industry in Kota Kefamenanu District can be determined by looking at the market share from the sales development of each company, industry concentration, and the level of concentration ratio of the three companies (CR<sub>3</sub>). These three factors can measure the competition between the tofu industries in Kota Kefamenanu District.

In calculating the industrial structure, first calculate the use of *market share* which can explain the amount of market share owned by the company concerned (Belangkae et al., 2014). Then from the *market share results*, the amount of market concentration is calculated using the Concentration Ratio (CR<sub>3</sub>) formula for the 3 companies that have the largest *market share* of the 4 companies in the industry (Risma et al., 2022; Relawati & Ningsih, 2021). Finally, *the Herfindahl-Hirseman Index* (IHH) emerged due to weaknesses in the development of the concentration ratio.

### Descriptive Results of Market Share Data

**Table 1.** Descriptive Market Share Data

No	Company name	Tofu Volume (Y)	Market share ( % )
1	Alpharia	19200	15,308
2	Work partners	24000	19,135
3	Source of Life	30000	23,918
4	New life	6912	5,510
5	Timor Jaya	22080	17,604
6	Fertile Trobus	17952	14,313
7	Al f a Omega	5280	4,209
	<b>Total</b>	<b>125424</b>	<b>100</b>

Source: Processed Primary Data, 2021

Based on the table above, we can see that the market *share* of the 7 tofu industries in Kota Kefamenanu District is 100% in total. of the 7 tofu industries, the first largest company (MS1) is the Sumber Hidup industry with a market share of 23.918%, followed by Mitra Kerja in second place with a market share of 19.1%; Timor Jaya (17.6%), Alfaria Tempe-Tahu (15.3%), GTT Trubus Subur (14.3%), New Life (5.5%), and the last position is occupied by Alfa Omega with a market share of 4.209% (MS7).

### Descriptive Results Concentration Ratio Data

**Table 2.** Descriptive data for calculating concentration ratios

No	Company name	Cr2
1	Work partners	19,135
2	Source of Life p	23,918
3	Timor Jaya	17,604
	<b>Total</b>	<b>60,658</b>

Source: Processed Primary Data, 2021

The concentration ratio (CR2) is the sum of the 7 tofu industries in Kota Kefamenanu District and then the 2 market shares which have a greater value than the 7 industries are taken. So it can be formulated as follows:

$$\begin{aligned} \text{CR2} &= \text{MS1} + \text{MS2} \\ \text{CR2} &= 19.135\% + 23.918\% + 17.604\% \\ &= 60.658\% \end{aligned}$$

Based on the calculation of the concentration results from the largest market share value, it can be seen that the CR2 value in the tofu industry in Kota Kefamenanu District is 60.658%, therefore it can be said that the value of  $0.4 \leq \text{CR2} \leq 0.8$  is included in the oligopoly market, so the tofu industry market in Kota Kefamenanu District, it is in an oligopoly market. The results of this study are similar to the study by Anggraeni & Baladina (2017) regarding the potato marketing system in Sumberbrantas Village, Batu City.

### Descriptive Results of Herfindahl Hirschman Index Data

**Table 3.** Herfindahl Hirschman Index Data

No	Company name	Tofu Volume (Y)	IHH
1	Al Faria	19200	0.023
2	Work partners	24000	0.036
3	Source of Life p	30000	0.057
4	New life	6912	0.003
5	Timor Jaya	22080	0.03
6	Fertile Trobus	17952	0.02
7	Alpha Omega	5280	0.001
	<b>Total</b>	<b>125424</b>	<b>0.173</b>

Source: Processed Primary Data, 2021

(IHH) then  $0.17354 \times 10,000 = 1735.4$  *The Herfindahl-Hirschman Index* (IHH) is the sum of the squared market shares for all companies in one industrial market, which aims to determine the degree of concentration of buyers in a market area (Arifin, 2014; Purnama et al., 2017; Sari et al., 2022). Based on the calculation results from the data above, it shows that the IHH value of the tofu industry in Kota Kefamenanu District is 1735.467 %, meaning that the IHH value ranges between 1000-2500 or  $0 < \text{IHH} < 0.999$ , so the tofu industry market in Kota Kefamenanu District is in the market type Oligopoly.

#### D. Conclusion

The market structure of the tofu industry in Kota Kefamenanu District is known from the research results that the largest market share control with the highest level of market share control (MS) is in the living resources industry behind the prison, namely 23.918%, while the lowest market share control (MS) is in the industry. Alpha omega is 4.209%. Research on the Concentration Ratio of three companies (CR3) resulted in the tofu industry in Kota Kefamenanu District being 60.658%, so it can be seen that the value is  $0.4 \leq CR3 \leq 0.8$  therefore the market structure of the tofu industry in Kota Kefamenanu District are in an oligopoly market. Meanwhile, from the calculation results of the *Herfindahl-Hirschman Index* of 1735.467 %, this means that the IHH value ranges between 1000-2500 or  $0 < IHH$ , then the tofu industrial market in Kota Kefamenanu District is in the Oligopoly market type.

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