

## ***Analysis Of Hydroponic Vegetable Sales Trend (Case Study: Fris Fresh Market)***

**Grasiela Delfine Amanupunnjo<sup>1</sup>, Dr. Ir. L. O. Kakisina, M.Si<sup>2</sup>, W. B. Parera, SP, M.Si<sup>3</sup>**

<sup>1,2,3</sup> Agricultural Extension Study Program , Faculty of Agriculture, Pattimura University  
Jln. Ir. M.Putuhena, Poka Campus - Ambon, Postal code, 97233

E-mail : [grasielaamanupunnjo@gmail.com](mailto:grasielaamanupunnjo@gmail.com)

### **Abstract**

*This study aims to determine the sales trend of selling hydroponic vegetables for 24 month, knowing the sales forecast of hydroponic vegetables, especially mustard greens and lettuce in 2024. The results show that sales of hydroponic vegetables, especially mustard greens and lettuce, have a fluctuating trend from 24 month well as forecasting results obtained for the sale of hydroponic vegetables, especially spoon mustard and lettuce in 2023. For hydroponic vegetable sales, especially for spoon mustard and lettuce in 2023, it has decreased or increased, where spoon mustard this year is 1,666 and lettuce this year is 2,487.*

**Keywords:** Sales Trend, Hydroponic Vegetables

### **INTRODUCTION**

Indonesia is an agricultural country, so many of Indonesia's population work in the agricultural sector, both in the fields of horticultural crops, food crops, and plantation crops. The natural conditions of Indonesia which have a wide expanse, tropical climate, and fertile means that the people from Indonesia work in agriculture. Organic farming is agriculture that uses natural ingredients for cultural activities so that the products produced are of high quality, healthy and safe for consumption. Food products that can be developed in Indonesia organically means food crops and horticulture. One of the horticultural products that has the potential and opportunity to be developed into superior products is vegetables.

Horticultural crops consist of various types, including fruit plants, vegetables, biopharmaceuticals, and ornamental plants. There are many types of plants, each of which has its own uses and functions. The production of several horticultural crops in Indonesia during the 2017-2021 period shows that generally vegetable production has increased from year to year

140

**IJETER, Volume 01 Issue 02, 2023**



Copyright to the author of some rights reserved This work is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).



despite a decline in population due to the co-19 pandemic. From this data it can also be seen that the vegetables that are most in demand by the public are mustard greens and eggplant, which during the pandemic, green vegetables are really needed for the immune defense of the human body. In Maluku Province, the development of mustard greens production during the period 2017-2021 has increased very rapidly. Even though the population in Ambon itself from 2017 was 444,797 million people and in 2022 has decreased to 348,255 million people where the decline in population was affected by the Covid-19 pandemic in 2019 to 2021. Sawi is quite relatively produced in Indonesia because mustard plant farming techniques are not too complicated and do not require large areas of land such as cultivating with the hydroponic method.

Hydroponics is a farming solution for increasingly narrow agricultural land (Sahara et al., 2021). Hydroponic plants are very helpful for household scales that do not have vacant land. In general, the hydroponic system has many advantages over conventional farming. Some of the advantages of the hydroponic system mean that media sterilization is quite clean, environmental sanitation is controlled, harvest time can be earlier and the quality, quantity and continuity that will occur are guaranteed (Rosa, 2019).

Many studies have proven the importance of consuming hydroponic vegetables so that many people flock to cultivate hydroponic vegetables and put them in supermarkets. According to Rahel Ananda Sitorus, trend analysis is statistical analysis by comparing data over time. Trend analysis is also an analytical method that is intended to make an estimate or forecast in the future.

## RESEARCH METHODS

This research was conducted at Fresh Fresh Market, Jl. Rijali, Karang Panjang Village, Sirimau District, Ambon City, Maluku. The research took place in January – February 2023. The type of data used in this research is quantitative data, which is a method for investigating objects that can be measured by numbers obtained from the Fresh Fresh Market. Sources of data collected in this study are primary data and secondary data, primary data is data obtained directly from the field (first data) through observation and structured interviews using interview and review procedures to the owner or manager of the Fresh Fresh Market. Secondary data is data collected from a second source, namely data obtained from related agencies, research reports, scientific papers, documentation and other information related to this research. Secondary data collection, obtained from documents owned by Fresh Fresh Market in the form of monthly sales reports on hydroponic vegetables, especially mustard greens and lettuce in the



period January-December 2021 to January-December 2022. The data analysis method uses trend analysis using the Least Square method. . The formula used in the Least Square method:

Description: Y = dependent variable

a = Y intercept, is a constant number

b = Slope of the trend line

X = Independent variable

## RESULTS AND DISCUSSION

Based on the results of research conducted on hydroponic vegetables, especially mustard greens and lettuce at the Fresh Fresh Market for a period of 24 months. Furthermore, calculations are carried out using trend analysis which aims to make an estimate or forecast in the future.

**Table 1. Calculation of the sales trend of hydroponic vegetables, especially mustard greens, in 2021**

| Months    | Sale (Y) | X   | XY    | X <sup>2</sup> | Trend |
|-----------|----------|-----|-------|----------------|-------|
| January   | 154      | -11 | -1694 | 121            | 145   |
| February  | 167      | -9  | -1503 | 81             | 201   |
| March     | 232      | -7  | -1624 | 49             | 257   |
| April     | 147      | -5  | -735  | 25             | 313   |
| May       | 429      | -3  | -1287 | 9              | 369   |
| June      | 425      | -1  | -425  | 1              | 425   |
| July      | 872      | 1   | 872   | 1              | 481   |
| August    | 514      | 3   | 1542  | 9              | 537   |
| September | 546      | 5   | 2730  | 25             | 593   |
| October   | 465      | 7   | 3255  | 49             | 649   |
| November  | 563      | 9   | 5067  | 81             | 705   |
| December  | 929      | 11  | 10219 | 121            | 761   |
| Total     | 5.443    | 0   | 16417 | 572            | 5.436 |

Source: Research Results

Based on the table and graph above, in 2021 the highest sales of hydroponic vegetables, especially mustard greens, will be in December and the lowest will be in April..

**Table 2. Calculation of the sales trend of hydroponic vegetables, especially mustard greens, in 2022**

| Months    | Sale (Y) | X   | XY    | X <sup>2</sup> | Trend |
|-----------|----------|-----|-------|----------------|-------|
| January   | 430      | -11 | -4730 | 121            | 335   |
| February  | 285      | -9  | -2565 | 81             | 327   |
| March     | 279      | -7  | -1953 | 49             | 319   |
| April     | 307      | -5  | -1535 | 25             | 311   |
| May       | 288      | -3  | -864  | 9              | 303   |
| June      | 118      | -1  | -118  | 1              | 295   |
| July      | 426      | 1   | 426   | 1              | 287   |
| August    | 490      | 3   | 1470  | 9              | 279   |
| September | 222      | 5   | 1110  | 25             | 271   |
| October   | 270      | 7   | 1890  | 49             | 263   |
| November  | 102      | 9   | 918   | 81             | 255   |
| December  | 282      | 11  | 3102  | 121            | 247   |
| Total     | 3499     | 0   | -2849 | 572            | 3492  |

Source: Research Results

In 2022 the highest sales of hydroponic vegetables, especially mustard greens, will be in August and the lowest will be in November.

**Table 3. Calculation of the selling price trend for hydroponic vegetables, especially mustard greens, in 2021**

| Months    | Price (Y) | X   | XY      | X <sup>2</sup> | Trend |
|-----------|-----------|-----|---------|----------------|-------|
| January   | 50000     | -11 | -550000 | 121            | 53830 |
| February  | 64400     | -9  | -579600 | 81             | 54364 |
| March     | 49700     | -7  | -347900 | 49             | 54898 |
| April     | 49900     | -5  | -249500 | 25             | 55432 |
| May       | 49900     | -3  | -149700 | 9              | 55966 |
| June      | 61800     | -1  | -61800  | 1              | 56500 |
| July      | 60500     | 1   | 60500   | 1              | 57034 |
| August    | 62000     | 3   | 186000  | 9              | 57568 |
| September | 60400     | 5   | 302000  | 25             | 58102 |
| October   | 61800     | 7   | 432600  | 49             | 58636 |

|          |        |    |        |     |        |
|----------|--------|----|--------|-----|--------|
| November | 54300  | 9  | 488700 | 81  | 59170  |
| December | 56500  | 11 | 621500 | 121 | 59704  |
| Total    | 681200 | 0  | 152800 | 572 | 681204 |

Based on the table and graph above, in 2021 the price of selling hydroponic vegetables, especially mustard greens, will be highest in February and the lowest will be in March.

**Table 4. Calculation of the selling price trend for hydroponic vegetables, especially mustard greens, in 2022**

| Months    | Price (Y) | X   | XY      | X <sup>2</sup> | Trend  |
|-----------|-----------|-----|---------|----------------|--------|
| January   | 65511     | -11 | -720621 | 121            | 63837  |
| February  | 61247     | -9  | -551223 | 81             | 64231  |
| March     | 62000     | -7  | -434000 | 49             | 64625  |
| April     | 61617     | -5  | -308085 | 25             | 65019  |
| May       | 61798     | -3  | -185394 | 9              | 65413  |
| June      | 62000     | -1  | -62000  | 1              | 65807  |
| July      | 70987     | 1   | 70987   | 1              | 66201  |
| August    | 85679     | 3   | 257037  | 9              | 66595  |
| September | 75885     | 5   | 379425  | 25             | 66989  |
| October   | 62036     | 7   | 434252  | 49             | 67383  |
| November  | 61838     | 9   | 556542  | 81             | 67777  |
| December  | 61453     | 11  | 675983  | 121            | 68171  |
| Total     | 792051    | 0   | 112903  | 572            | 792048 |

In 2022 the highest sales of hydroponic vegetables, especially mustard greens, will be in August and the lowest will be in February.

**Tabel 5. Calculation of the sales trend of hydroponic vegetables, especially lettuce in 2021**

| Months   | Sale (Y) | X   | XY    | X <sup>2</sup> | Trend |
|----------|----------|-----|-------|----------------|-------|
| January  | 149      | -11 | -1639 | 121            | 220   |
| February | 228      | -9  | -2052 | 81             | 250   |
| March    | 145      | -7  | -1015 | 49             | 280   |
| April    | 294      | -5  | -1470 | 25             | 310   |
| May      | 398      | -3  | -1194 | 9              | 340   |
| June     | 358      | -1  | -358  | 1              | 370   |

|           |      |    |      |     |      |
|-----------|------|----|------|-----|------|
| July      | 883  | 1  | 883  | 1   | 400  |
| August    | 383  | 3  | 1149 | 9   | 430  |
| September | 398  | 5  | 1990 | 25  | 460  |
| October   | 439  | 7  | 3073 | 49  | 490  |
| November  | 428  | 9  | 3852 | 81  | 520  |
| December  | 518  | 11 | 5698 | 121 | 550  |
| Total     | 4621 | 0  | 8917 | 572 | 4620 |

In 2021 the sales of hydroponic vegetables, especially lettuce, with the highest sales in December and the lowest sales are in March.

**Tabel 6. Calculation of the sales trend of hydroponic vegetables, especially lettuce in 2022**

| Months    | Sale (Y) | X   | XY    | X <sup>2</sup> | Trend |
|-----------|----------|-----|-------|----------------|-------|
| January   | 617      | -11 | -6787 | 121            | 645   |
| February  | 463      | -9  | -4167 | 81             | 673   |
| March     | 680      | -7  | -4760 | 49             | 701   |
| April     | 808      | -5  | -4040 | 25             | 729   |
| May       | 939      | -3  | -2817 | 9              | 757   |
| June      | 893      | -1  | -893  | 1              | 785   |
| July      | 980      | 1   | 980   | 1              | 813   |
| August    | 733      | 3   | 2199  | 9              | 841   |
| September | 817      | 5   | 4085  | 25             | 869   |
| October   | 749      | 7   | 5243  | 49             | 897   |
| November  | 794      | 9   | 7146  | 81             | 925   |
| December  | 1122     | 11  | 12342 | 121            | 953   |
| Total     | 9595     | 0   | 8531  | 572            | 9588  |

In 2022 the sales of hydroponic vegetables, especially lettuce, with the highest sales in December and the lowest sales are in February.

**Tabel 7. Calculation of the price trend of hydroponic vegetables, especially lettuce in 2021**

| Months   | Price (Y) | X   | XY      | X <sup>2</sup> | Trend |
|----------|-----------|-----|---------|----------------|-------|
| January  | 70000     | -11 | -770000 | 121            | 74415 |
| February | 87500     | -9  | -787500 | 81             | 73491 |
| March    | 70000     | -7  | -490000 | 49             | 72567 |

|                  |        |    |         |     |        |
|------------------|--------|----|---------|-----|--------|
| <b>April</b>     | 74300  | -5 | -371500 | 25  | 71643  |
| <b>May</b>       | 70000  | -3 | -210000 | 9   | 70719  |
| <b>June</b>      | 69800  | -1 | -69800  | 1   | 69795  |
| <b>July</b>      | 62000  | 1  | 62000   | 1   | 68871  |
| <b>August</b>    | 62000  | 3  | 186000  | 9   | 67947  |
| <b>September</b> | 62000  | 5  | 310000  | 25  | 67023  |
| <b>October</b>   | 62000  | 7  | 434000  | 49  | 66099  |
| <b>November</b>  | 62000  | 9  | 558000  | 81  | 65175  |
| <b>December</b>  | 80400  | 11 | 884400  | 121 | 64251  |
| <b>Total</b>     | 832000 | 0  | -264400 | 572 | 831996 |

In 2021 the sales of hydroponic vegetables, especially wrapped lettuce, with the highest sales in February and the lowest sales are in July, August, September, October, November.

**Tabel 8 . Calculation of the sales trend of hydroponic vegetables, especially lettuce in 2022**

| <b>Months</b>    | <b>Sale (Y)</b> | <b>X</b> | <b>XY</b> | <b>X<sup>2</sup></b> | <b>Trend</b> |
|------------------|-----------------|----------|-----------|----------------------|--------------|
| <b>January</b>   | 70326           | -11      | -773586   | 121                  | 66916        |
| <b>February</b>  | 64551           | -9       | -580959   | 81                   | 67134        |
| <b>March</b>     | 65433           | -7       | -458031   | 49                   | 67352        |
| <b>April</b>     | 65588           | -5       | -327940   | 25                   | 67570        |
| <b>May</b>       | 62833           | -3       | -188499   | 9                    | 67788        |
| <b>June</b>      | 65620           | -1       | -65620    | 1                    | 68006        |
| <b>July</b>      | 72514           | 1        | 72514     | 1                    | 68224        |
| <b>August</b>    | 87754           | 3        | 263262    | 9                    | 68442        |
| <b>September</b> | 66124           | 5        | 330620    | 25                   | 68660        |
| <b>October</b>   | 59316           | 7        | 415212    | 49                   | 68878        |
| <b>November</b>  | 67443           | 9        | 606987    | 81                   | 69096        |
| <b>December</b>  | 69875           | 11       | 768625    | 121                  | 69314        |
| <b>Total</b>     | 817377          | 0        | 62585     | 572                  | 817380       |

In 2022 the results of the selling price of hydroponic vegetables, especially lettuce, with the highest sales in August and the lowest sales are in October.



## DISCUSSION

Based on the results of spoon mustard research, in 2021 the total sales of hydroponic vegetables, especially spoon mustard, were 5,443 packs with the highest sales in December, namely 929 packs and the lowest sales were in April, with 147 packs. In 2022, the total sales of hydroponic vegetables, especially mustard greens, were 3,499 packs, the highest sales were in August, namely 490 packs, and the lowest sales were in November, with 102 packs. The factor causing the decline in sales was the condition of vegetables that were attacked by many pests so that suppliers supplied them according to predetermined standards and quality.

In 2021 the total selling price of hydroponic vegetables, especially mustard greens, is Rp. 681,200.- with the highest sales in February, which is Rp. 64,400.- and the lowest sales were in March of Rp.49,700.-. In 2022 the total sales of hydroponic vegetables, especially spoon mustard, is Rp. 792,051, - with the highest sales in August, namely Rp. 85,679, - and the lowest sales were in February of Rp. 61,247, -.

Whereas in 2021 the total sales of hydroponic vegetables, especially lettuce, were 4,621 packs with the highest sales in December of 518 packs and the lowest sales were in March of 145 packs. The factor causing the high sales this year was due to the large number of requests by customers who have SMEs in the culinary field. There were also many culinary trends that year that led to high sales of lettuce. The product and price trend lines generated in the sale of hydroponic vegetables, especially lettuce, in 2021 show a positive trend, because the trend line starts from the left to the top right and the increase that has occurred this year is very significant.

In 2022 the total sales of hydroponic vegetables, especially lettuce, were 9,595 packs with the highest sales in December of 1122 packs and the lowest sales in February of 463 packs. The factors causing the high sales this year are not much different due to the large number of requests by customers who have SMEs in the culinary field. Many consumers also choose to live healthily by consuming vegetables such as lettuce because it is very easy to process as breakfast or lunch for everyone. In December, it is very clear how high the sales of lettuce this month are due to the Christmas of Christ coupled with the large amount of content - healthy living content by regulating diet which is widely posted on tiktok, Facebook and Instagram.

Data collection is done by analyzing monthly sales data based on trend analysis made in 24 month reports. The data used is data from the analysis of sales trends within a period of 24 months starting from January 2021 to December 2022. Calculation of the trend of selling hydroponic vegetables, especially mustard greens and lettuce in 2021-2022 is used to calculate predictions (forecasting) for 2023. Based on the results calculations, sales of hydroponic





vegetables for mustard greens in 2023 are predicted to sell 2,340 packs at a price of IDR 848,784. Factors that affect the decline in sales of mustard greens later in 2023 could be caused by several factors, including decreased interest in consuming mustard greens and to maintain the trend value so that it continues to increase, it is hoped that the prices given will remain consistent even though the sales or products sold do not meet the demand. standard. And for 2024 the results of the calculation alone, sales of hydroponic vegetables for spoon mustard this year are predicted to sell 6,372 packs at a price of IDR 1,637,040.-. To maintain that the products and prices are always increasing, the Fresh Fresh Market itself must make promotions that attract the interest of existing consumers so as not to create a feeling of boredom with the products being sold.

While the results of the calculation show that sales of hydroponic vegetables for lettuce in 2023 are predicted to sell 13,620 packs at a price of IDR 848,772. The fresh fresh market must maintain an increase in product sales and also prices in the competitive era from existing supermarkets by maintaining the quality of existing products. While the results of the calculation, sales of hydroponic vegetables for lettuce in 2024 are predicted to sell 17,652 bugkus at a price of IDR 1,635,012. Fresh fresh market must maintain price and product quality and increase promotional activities so that consumers are more interested in shopping. The results of this forecast can be a consideration for the Fresh Fresh Market to be targeted for achievement. This must be seen and paid attention to so that sales results reach forecast results, namely by taking advantage of all the opportunities they have, such as maximizing sales more, so that they can reach all consumers so they can meet future needs. Thus the hydroponic vegetables will increase.

## CONCLUSION

Sales of hydroponic vegetables have a fluctuating trend from year to year where there is an increase in sales in certain years and there is also a decrease in certain years for both vegetables, namely mustard greens and lettuce. The results of calculations using Least square analysis show that sales of hydroponic vegetables, especially mustard greens, for 24 months have decreased by 5,443 in 2021 to 3,499 in 2022. Likewise, sales of hydroponic vegetables, especially lettuce, for 2 years have increased by 4,621 in 2021 to 9,595 in 2022.

Forecasting results obtained for sales of hydroponic vegetables, especially spoon mustard and lettuce in 2023 have decreased or increased, where spoon mustard this year amounted to 2,340 and lettuce this year amounted to 13,620. Likewise, in 2024 there will be an increase where for spoon mustard in 2024 it will be 6,372 and for lettuce itself it will be 17,652.



The results of this forecast can be used as a target for sales of hydroponic vegetables, especially for mustard greens and lettuce in 2023 and 2024.

## REFERENCES

- Abas, M. Z. S. (2014). Pertumbuhan Dan Hasil Tanaman Caisim (*Brassica Juncea*L) Berdasarkan Variasi Jarak Tanam Dan Varietas. *Skripsi*, 1(613409092).
- Achmad, A. (2002). Potensi dan Sebaran Kupu-kupu di Kawasan Taman Wisata Alam Bantimurung. Sulawesi Selatan. Sulawesi Selatan.
- Adiwilaga, 2010. Faktor-faktor yang Mempengaruhi Sisi Permintaan dan Sisi Penawaran Sayuran Sawi. Bandung: Penerbit Alumni Bandung.
- Andriani, et.al (2020). Pelatihan Pemanfaatan Lahan Pekarangan untuk Budidaya Tanaman di Kecamatan Kerek Kabupaten Tuban. *GERVASI: Jurnal Pengabdian kepada Masyarakat*, 4(1), 116-125.
- Agrios, G. N. 2005. *Plant Pathology*. Fifth Edition. USA : Elsevier Academic Press. 922 p. Aini et al. 2010. Penerapan Bionutrien KPD pada tanaman selada keriting (*Lactuca sativa* L.). *Jurnal Sains dan Teknologi Kimia*, 1 (1): 73-79.
- Bagus Tripama dan Muhammad Rizal Yahya. 2018. Respon Konsentrasi Nutrisi Hidroponik terhadap tiga Jenis Tanaman Sawi (*Brassica juncea* L.) *Agritrop* Volume 16 (2), Desember 2018. ISSN 1693-2877.
- Firnando, Diki. 2018. Analisis Peramalan Penjualan Buncis Super di Gapoktan XXX Bandung Barat. [Jurnal Penelitian]. Lampung: Poilteknik Negeri Lampung.
- Hamidah, Siti. 2015. Sayuran dan Buah Serta Manfaatnya Bagi Kesehatan. Yogyakarta: Fakultas Teknik Universitas Negeri Yogyakarta.
- Hendra, H.A dan Andoko, Agus. 2014. Bertanam Sayuran Hidroponik Ala Pak Tani Hydrofarm. Jakarta: PT. Agromedia Pustaka.
- Jakarta Open Data. 2020. Data Luas Panen dan Produksi Sayuran DKI Jakarta Tahun 2013-2017.
- Harjono, I. 2001. Sayur-sayur Daun Primadona. Aneka, Solo. 145 hlm. Haryanto et al. 1995. Sawi dan Selada. Penebar Swadaya. Jakarta.
- Haryanto et al. 2002. Bertanam Selada dan Sawi. Penebar Swadaya : Jakarta. Haryanto et al. 2007. Sawi dan Selada. Penerbit penebar swadaya, Wisma Hijau. Jl Raya Bogor KM 30. Mekar Sari Cimanggis. Depok 16952.
- Sugiarto, dan Harijono. 2000. Peramalan Bisnis. Jakarta: PT. Gramedia Putaka Utama