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Analysis of the influence of internal and external factors on consumer behavior of fresh vegetables in the modern market in Jambi city

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Abstract

Vegetables are an essential need for the human body as a source of vitamins A and C. Consumption of these vegetables is influenced by behavior towards buying fresh vegetables. In this case, the research is aimed at analyzing consumer behavior towards purchasing decisions for fresh vegetables. This research was conducted in modern markets, namely Jambi Town Square (Jamtos) modern market, Jambi prima mall (JPM) Trona, and Meranti. Which was taken purposively, the size of 35 respondents. The data analysis method uses the structural equation model-partial least square (SEM-PLS). The results showed that all the manifest variables used in the variables of internal factors, external factors, moderating variables and consumer behavior variables were valid and reliable, internal factors with manifest variables were educational level, occupation, income level, perceptions had a positive and significant effect on consumer behavior. external factors with the manifest variables of culture, family, environment, social class have a positive effect but do not have a significant effect on consumer behavior, internal factors and external factors have a positive and significant effect on consumer behavior with the moderating variable of fresh vegetables, the moderating variable of fresh vegetables has a positive effect and significant impact on consumer behavior.

Keywords: Consumer Behavior; Fresh Vegetables; Purchase Decision; Internal factors; External factors.

1. Introduction

Food is an essential human need. All Indonesian people have the right to meet their needs for adequate and nutritious food. Along with the growth of population and society, the need for variety and quality of food is also increasing. Consistent with the aim of the Ministry of Agriculture which is to promote food diversification, by reducing the use of rice and wheat and replacing it with the use of animal products, fruits, vegetables and tubers. Vegetables are food that is very necessary for the human body because they contain various benefits such as minerals, fiber and a source of vitamins, especially vitamin A and vitamin C.

The Indonesian population's spending on food in 2020 is mostly allocated for prepared food and beverages which reach 34.27%, followed by cigarettes by 12.17%, grains 11.07%, fish 7.72%, vegetables by 7, 52%, eggs and milk by 5.78%, and other food groups less than 5%. The spending pattern of the Indonesian population for food ingredients has seen a change in prepared food which has decreased to 34.27% in 2020, while spending on vegetables, fruit and eggs has increased from the previous year [1]

Food expenditure per capita The vegetable and fruit group had the largest growth in nominal expenditure, increasing 19.78% and 9.74%/year [2]. The monthly per capita expenditure of the population of Jambi Province according to the processed food and beverage commodity group was IDR 160,014.00, followed by cigarettes and tobacco IDR 82,512.00, Grains IDR 71,808.00, Vegetables IDR 69,871.00, and Fish IDR 61,070.00, while for other commodities it is not more

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than IDR 32,000.00 per month, spending on vegetables is in the fifth position with the highest expenditure in Jambi Province [3].

Residents in Jambi City can get vegetables at traditional markets and modern markets. The rapid growth of traditional markets and modern markets, the spread of markets and trade centers in Jambi City; 8 traditional markets, 7 shopping markets and 18 supermarkets. Consumer behavior can be defined as the actions of customers in finding, investigating, using, and making purchasing decisions for items that are supposed to satisfy their needs. Demand will drive consumer behavior, which in turn will influence consumption choices on various vegetable varieties. Consumers will choose goods provided by producers so that the goods purchased meet their demands. Consumers choose fresh vegetables for various reasons. every consumer has factors that influence their decision to buy the vegetable products they want.

Consumer behavior can be influenced by several factors including external factors which include: culture (culture), subculture (subculture), demographics, family, and reference groups. Meanwhile, internal factors that can influence consumers include preferences, learning, memory, motivation, personality, emotions, and attitudes [4]. Attributes of fresh vegetables such as marketing mix and product attributes include consumer criteria in buying fresh vegetables. In marketing practices, modern markets are still difficult to understand which aspects influence customer decisions. Therefore, market managers must understand what factors influence consumer behavior when making decisions to buy fresh vegetables for their needs.

2. Material and method

This research was conducted at three modern markets in Jambi City, namely Jambi Town Square (Jamtos), Meranti, and Jambi Prima mall (JPM) Trona. The selection was made using a purposive method with the consideration that the modern market markets fresh vegetable products continuously. This research was conducted on 12 December 2022 – 10 January 2023.

This study uses primary data and secondary data. In this study, primary data was obtained from consumers who bought fresh vegetables, respondents through interviews using a prepared questionnaire according to the desired data requirements. Secondary data obtained from company statistics, related agencies and journals relevant to research.

Sampling was carried out at modern markets in Jambi City, namely modern markets Jambi Town Square, Meranti, and Jambi Prima Mall (JPM) Trona. The sample size was 35 respondents, [5] prove only by using 20 data they can use PLS-SEM correctly [6].

2.1. Data Analysis Methods Using Structural Models

The Partial Least Square-Structural Equation Model (PLS-SEM) is a relationship between exogenous and endogenous variables or between endogenous and endogenous variables [7].
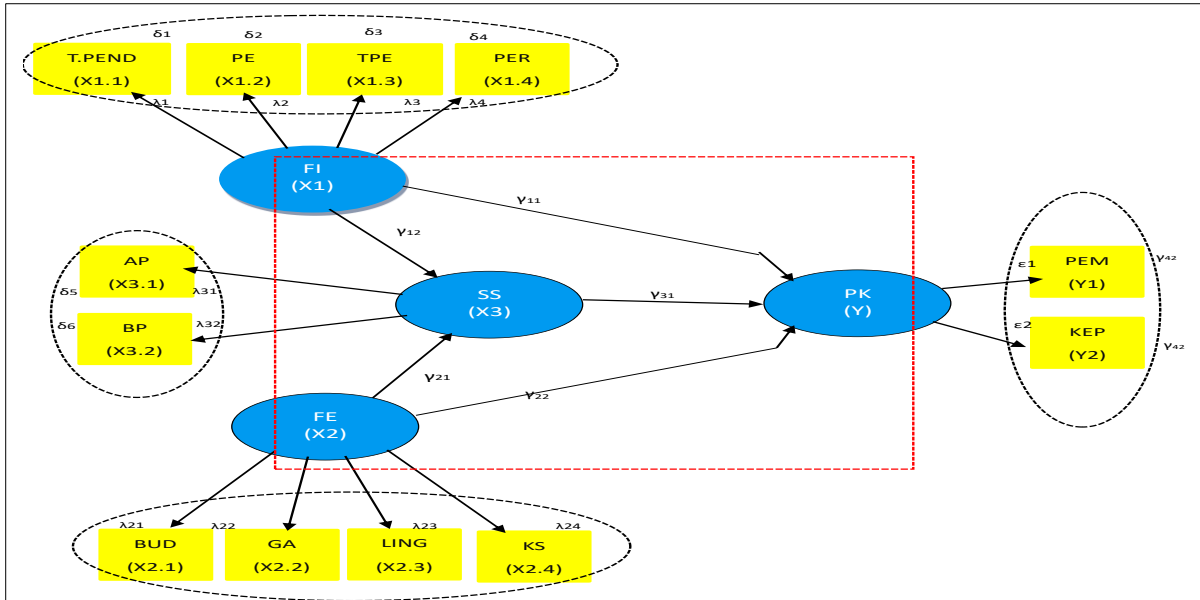
FI: Internal Factors; T.PEND: Level of education; PE: Work; TPE: Income window; PER: Perception; FE: External factors; BUD: Culture; GA: Family; LINGS: Environment; KS: Social class; SS: Fresh vegetables; AP: Product Attributes; BP: Marketing Mix; PK: Consumer behavior; PEM: Product selection; KEP: Purchasing Decision; λ (small lambda) = Represents the parameter that relates between the exogenous latent variable (ζ) and the observed variable (X) or the residual covariance of the two observed measures (X)/ loading factor; δ (small delta) = Represents the parameter associated with the residual variance variable of the observed size (X) or the covariance of the residual variance of the two observed sizes from the exogenous side; ε (small efsilon) Represents the parameter associated with the residual variance of the observed size (Y) or the covariance of the residual variance of the two observed measures on the endogenous side; γ (low gamma)= Represents parameters related to the relationship between exogenous variables (ζ) and endogenous variables (η); β (small beta) = Represents parameters related to two endogenous variables (η); ζ (zeta) = Represents the value of the covariance between errors (error) of (η)

= Variabel laten   =Variabel Manifest   = Koefisien jalur   = Outer model   = Inner model

Figure 1 Figure 1 Path diagram of exogenous latent variables, moderating latent variables to dependent variables in the modern market in Jambi city

2.2. Model Fit Test

2.2.1. OuterModel

Composite reliability (ρ c) The indicator group that measures a variable has good composite reliability if the composite reliability value is ⩾ 0.7, although it is not an absolute standard [8].

If the average variance extracted (AVE) construct is greater than the correlation with all other constructs then it is said to have good discriminant validity. It is recommended that the measurement value should be greater than 0.50[8]

AVE value can be calculated using:

$$AVE = \frac{\sum \lambda_{i^2}}{\lambda_{i^2} + \sum_i var(\varepsilon_i)}$$

The accepted limit value for the level of composite reliability (ρ c) is ⩾ 0.7, although it is not an absolute standard. The pc value can be calculated by:

$$\rho c = \frac{(\sum \lambda_{i^2})}{(\sum \lambda_{i^2}) + \sum_i var(\varepsilon_i)}$$

2.3. Discriminant validity

Discriminant validity aims to determine the extent to which a construct is truly different from other constructs (constructs are unique). Judging from the Fornell-Larcker criteria, that is if the square root values of

the AVE value are greater than the highest correlation value of a variable with other variables, then the variable has good/valid discriminant validity [9]

If the average variance extracted (AVE) construct is greater than the correlation with all other constructs then it is said to have good discriminant validity. It is recommended that the measurement value should be greater than 0.50[8].

2.4. Inner Model

R-Square is a measure of the proportion of variation in the value of the affected (endogenous) variable that can be explained by the (exogenous) influencing variable [10]

Predictive Relevance (Q-Square) Q^2 for structural models that measure how well the values produced by the model and also the parameter estimates.

Q-square is done by the formula:

$$Q^2 = 1 - (1 - R_{12})(1 - R_{22})\ldots(1 - R_n^2)$$

where, R_{12}, R_{22}, ... R_n^2 is the R-square of the endogenous variables in the equation model. $0 < Q2 < 1$., where the closer to 1 means the model is better.

F-Square (effect size) is a measure used to assess the relative impact of an influencing variable (exogenous) on the affected variable (endogenous) [10].

3. Results And Discussion

3.1. Characteristics of Fresh Vegetable Consumers in Modern Markets

The characteristics of fresh vegetable consumers who were taken as respondents in this study, based on age, showed that most of the consumers were aged 31-35 years (71.42%), the ethnicity that shopped the most for fresh vegetables in modern markets was Chinese Ethnicity (54.28%)), the priority of shopping at modern markets is as much as (74.28%) of consumers, the level of importance of consuming fresh vegetables according to fresh vegetables is very important as much as (68.57%), the benefits expected by consumers in consuming fresh vegetables consumption of vegetables as a complement to the food menu is as much as (65.71%), the wife is the decision maker for purchasing vegetables at the modern market (57.14%), the process of deciding to buy fresh vegetables at the modern market consumers shop for fresh vegetables in a planned manner (77.14%), the frequency of consumers in shopping fresh vegetables in the modern market in Jambi City are carried out every day (62.85%), the types of vegetables that are often consumed are leaf vegetables (42.85%).Uji Kecocokan Model Pengukuran (Outer model)

The measurement model or outer model shows how the observed or manifest variables represent latent constructs that are measured by testing the validity and reliability of latent constructs. Convergent validity of the means- surement model with reflection indicators can be seen from the correlation between item scores or construct indicators.

Table 1. Describes the outer loading value and AVE value of all indicators having a loading factor value of > 0.7 and an AVE value > 0.5, this proves that all indicators meet the requirements for initial examination and show covariance with or linkages to other indicators and testing Covergent validity of the data for all indicators of the loading model has a value greater than 0.7, which means that the construct is acceptable. Consistent with (Imam, Ghozali in widodo and Wati ningsih, 2020), an outer loading or loading factor value between 0.5 – 0.6 is considered sufficient to meet the requirements of convergent validity. And the composite value of reliability and Cronbach's alpha shows that the four latent variables, namely internal factors (X1) are 0.885 and 0.829, external factors (X2) are 0.848 and 0.760, fresh vegetables (X3) are 0.905 and 0.791, and consumer behavior (Y) of 0.886 and 0.742. The Cronbach's alpha value for all variables has a value above 0.7, so the model can continue to be interpreted consistently with Juliandi, 2018 [10] An indicator is declared to meet construct reliability and validity if the Composite Reliability value is above 0.6.

Table 1 Validity and Reliability of Exogenous Latent Variables, Moderating Latent Variables and Consumer Behavior Variables in the Modern Market, 2022

Instrument	Factor Loading Validity	AVE	Reability Cronbanch's Alpha	Composite Reability
Internal Factors (X$_1$)				
Education Level (X$_{1.1}$)	0.851			
Work (X$_{1.2}$)	0.816			
Income Level (X$_{1.3}$)	0.807	0.658	0.829	0.885
Perception (X$_{1.4}$)	0.769			
External Factors (X2)				
Culture (X$_{2.1}$)	0.764			
Family (X$_{2.2}$)	0.729	0.582	0.760	0.848
Environment (X$_{2.3}$)	0.820			
Social Class (X$_{2.4}$)	0.735			
Fresh Vegetables (X$_3$)				
Product Attributes (X$_{3.1}$)	0.903			
Marketing Mix (X$_{3.2}$)	0.916	0.827	0.791	0.905
Consumer Behavior (Y)				
Product Selection (Y$_1$)	0.888	0.795	0.742	0.886
Purchase Decision (Y$_2$)	0.895			

3.2. Structural Model Fit Test (Inner Model)

3.2.1. Testing the R Square Value of the Combination of Independent Variables Together Affects the Value of the Dependent Variable

Inner model testing aims to see the relationship between construct (latent) variables and other construct (latent) variables. The R-Square value of the Moderation Variable of Fresh Vegetables and the endogenous Consumer Behavior Variable can be seen in Table 2.

Table 2 R2 Value of Moderation Variable Fresh Vegetables and Modern Market Consumer Behavior Variables, 2022

R Squared	
Fresh Vegetables (X3)	0.538
Consumer Behavior (Y)	0.659

Table 2 describes that the variable Fresh Vegetables (X3) has an R2 value of 0.538, meaning that the moderating variable Fresh Vegetables can be simultaneously influenced by indicators on other latent variables of 53.8%, which means the model is categorized as moderate. While the remaining 46.2% is explained by other variables not included in the research model. The results of this study are consistent with Chin, 1998 [5] The R-Square value can be said to be moderate if the R-Square value is more than 0.33.

The consumer behavior variable has an R2 value of 0.659, meaning that the consumer behavior variable can be jointly influenced by internal factors, external factors, and the moderating variable Fresh Vegetables with product attribute indicators and the marketing mix that is equal to 65.9%, which means the model is categorized as moderate . While the remaining 34.1% is explained by other variables not included in the research model.

3.2.2. The Q-Square Value of the Relative Effect of the Structural Model on Observational Measurement of Consumer Behavior Variables

The goodness of fit test can be seen from the calculated Q-square value, the higher the Q-Square value, the

better the model can be said. The following is the result of the Q-Square calculation:

Q-Square= 84,2 %

Q^2 value = 0.842 < 1 (close to 1), means good predictive relevance. This shows that the amount of diversity contained in this study is 84.2%. So it can be concluded that 84.2% of endogenous variables Consumer behavior with indicators Product selection and purchasing decisions are influenced by internal factors (X1), external factors (X2) through the moderating variable Fresh Vegetables (X_3). While 15.8% is influenced by other factors that are not included in the research model.

3.2.3. F-Square Testing Effect of Exogenous Latent Variables on Consumer Behavior Variables

The f-square value is used to determine the effect of predictor variables on consumer behavior variables. The F-Square value of the Effect of Exogenous Latent Variables on Dependent Variables can be seen in Table 3.

Table 3 F-Square Values Effect of Exogenous Latent Variables on Consumer Behavior Variables

	F square	
	Consumer Behavior (Y)	**Fresh vegetables (X3)**
Internal Factors (X1)	0.256	0.161
External Factors (X2)	0.008	0.206
Fresh vegetables (X3)	0.201	
Consumer Behavior (Y)		

Table 3. The f-Square value of the internal factor (X1) on consumer behavior (Y) is 0.256, thus the effect is classified as moderate from the exogenous variable Internal Factor (X1) on the endogenous variable Consumer Behavior (Y). While the f-Square value of the Internal Factor variable (X1) on the moderating variable Fresh vegetables (X3) is 0.161, thus the effect is classified as Moderate/moderate from the exogenous variable Internal factor (X1) on the moderating variable Fresh Vegetables (X3).

The f-Square value of External Factors (X2) on Consumer Behavior (Y) is 0.008, so the effect is relatively small. Whereas the f-Square value of the External Factor variable (X2) to the moderating variable Fresh Vegetables (X3) is 0.206, so the effect is classified as moderate. Consistent with Supranto and Limakrisna, (2011) in Aliami et al. 2022 [11] that consumer behavior can be influenced by several factors including external factors which include: culture, subculture, demographics, family, and reference groups.

3.3. Analysis of the Effect of Total Internal Factors, External Factors, and Moderation Variables of Fresh Vegetables on Consumer Behavior of Fresh Vegetables, 2022

The total effect for more than two latent variables results from the sum of the direct and indirect effects. In this study there were 4 latent variables so that the effect of this study could be explained through the total effect. The value of the total influence of internal and external factors on consumer behavior can be seen in Table 4.

Table 4, describes the Total Effect value (total effect) obtained in the study as follows: The influence of Internal Factors (X1) on Consumer Behavior (Y) is positive and significant with a path coefficient value of 0.582 and P-Values 0.000 <0.05, can be This means that in total every time the internal factor is strengthened by 10%, there will be a strengthening of the consumer behavior variable by 5.82%. While the Internal Factor (X1) has a positive and significant effect on the moderating variable Fresh Vegetables (X3), where the path coefficient is 0.375 and P-Values 0.010 <0.05. it can be interpreted that every time the total level of education, occupation, income level and consumer perception is strengthened by 10%, there will be a strengthening in the consumer behavior variable with product selection indicators and marketing mix of 3.75%.

Table 4 Total Effect of Internal Factor Variables, External Factors, and Moderation Variables of Fresh Vegetables on Consumer Behavior in Modern Markets, 2022

Relationship between variables	Path coefficient	Average sample	Standard Deviation	t-Statistics	P-Value	information
Internal factors (X1) → Consumer Behavior (Y)	0.582	0.591	0.131	4.441	0.000	positive and significant
Internal factors (X1) → Fresh Vegetables (X3)	0.375	0.373	0.145	2.579	0.010	positive and significant
External factors (X2) → Consumer Behavior (Y)	0.242	0.248	0.142	1.705	0.089	Positive and not significant
External factors (X2) → Fresh Vegetables (X3)	0.424	0.437	0.123	3.444	0.001	positive and significant
Fresh vegetables (X3) → Consumer Behavior (Y)	0.385	0.364	0.126	3.065	0.002	positive and significant

The influence of external factors (X2) on consumer behavior (Y) is positive and significant with a path coefficient value of 0.242 and a P-value of 0.089 > 0.05, which means that every time the external factor is strengthened by 10%, there will be a total strengthening of the behavior variable. consumers with product selection indicators and purchasing decisions of 2.42%. The influence of external factors (X2) in total has a positive and significant effect on the moderating variable of fresh vegetables (X3) where the path coefficient is 0.424 and P-Values 0.001 <0.05. it can be interpreted that every time the external factor is strengthened by 10%, there will be a total strengthening of the moderating variable of fresh vegetables by 4.24%.
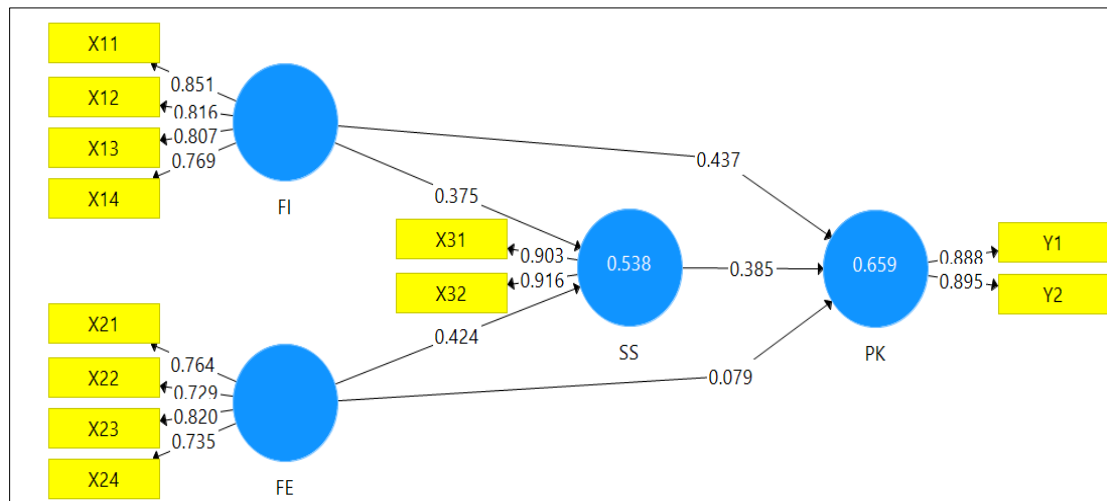

Figure 2 Path Diagram of the Influence of Internal Factors, External Factors and Moderation Variables of Fresh Vegetables on Consumer Behavior in the Jambi City Modern Market

The effect of fresh vegetables (X3) on consumer behavior (Y) is positive and significant with a path coefficient value of 0.385 and P-Values 0.002 <0.05, this means that every time there is a strengthening of the product attribute indicators and marketing mix by 10%, there will be a strengthening in total to consumer behavior variables with indicators of product selection and marketing mix of 3.85%. Consistent with research from (Andilla, 2011) which states that consumers will pay attention to the attributes of vegetable texture as a very important attribute, followed by the cleanliness of vegetables, the brightness of vegetables, the freshness of vegetables, and the price of vegetables. on

market attributes, product diversity is a very significant characteristic for modern market customers, followed by market layout, proximity to location, parking facilities, venue cleanliness, bathrooms, and vendor friendliness.

The path diagram of internal and external factor variable indicators on consumer behavior can be seen in Figure 1.

3.4. Analysis of the Effect of Manifest Variables on Latent Variables

The effect of the indicators on the latent variables can be seen in table 6.

Table 6, describes the value of the Internal Factor variable (X1) on the indicators that together are able to explain internal factors, if there is a strengthening of 10% for each indicator it will strengthen the education level variable by 8.51%, employment by 8.16% , the income level is 8.07% and the perception coefficient is 7.69%.

External Factor Variables (X2) on the indicators together as manifest variables that are able to explain external factor variables, if there is a 10% strengthening of the indicators it will strengthen the cultural variable by 7.64%, family by 7.29%, environment of 8.20%, and social class of 7.35%.

Fresh vegetables moderating variable (X3) product attributes and marketing mix together as manifest variables that are able to explain fresh vegetables variables. If there is a strengthening of the moderating variable of fresh vegetables by 10%, it will strengthen the product attributes by 9.3%, and the marketing mix by 9.16%.

Table 6 Effect of Manifest Variables on Latent Variables

Original Sample (S0)		Sample Mean (M)	Standart Deviasi (STDEV)	t- Statistik (O/STDE)	P-Value
$X_{11} \leftarrow FI$	0.851	0.855	0.052	16.384	0.000
$X_{12} \leftarrow FI$	0.816	0.804	0.091	8.970	0.000
$X_{13} \leftarrow FI$	0.807	0.807	0.078	10.299	0.000
$X_{14} \leftarrow FI$	0.769	0.762	0.144	5.358	0.000
$X_{21} \leftarrow FE$	0.764	0.762	0.065	11.790	0.000
$X_{22} \leftarrow FE$	0.729	0.726	0.122	5.987	0.000
$X_{23} \leftarrow FE$	0.820	0.816	0.064	12.763	0.000
$X_{24} \leftarrow FE$	0.735	0.734	0.092	7.974	0.000
$X_{31} \leftarrow SS$	0.903	0.901	0.033	27.572	0.000
$X_{32} \leftarrow SS$	0.916	0.913	0.030	30.538	0.000
$Y_1 \leftarrow PK$	0.888	0.885	0.044	20.095	0.000
$Y_2 \leftarrow PK$	0.895	0.896	0.032	28.212	0.000

Consumer Behavior Variable (Y) with product selection indicators and purchasing decisions together as manifest variables can explain consumer behavior variables. If there is a strengthening of consumer behavior by 10%, it will strengthen the product selection coefficient by 8.88%, and purchasing decisions by 8.95%.

4. Conclusion

Characteristics of consumers in buying fresh vegetable products at the modern market Based on age, it shows that most consumers are aged 31-35 years (71.42%), Chinese ethnicity is the most dominant ethnic group for shopping for vegetables at modern markets (54.28%), priority places consumers shop at modern markets as much as (74.28%), consumers consider consuming fresh vegetables very important as much as (68.57%), consumers consume fresh vegetables as a complement to the food menu as much as (65.71%), the wife is the decision maker for purchasing vegetables in the modern market (57.14%), consumers buy fresh vegetables in a planned manner (77.14%), the

frequency of consumers shopping for fresh vegetables in the modern market is done every day (62.85%), types of vegetables which are often consumed are leaf vegetables (42.85%).

Factors that influence consumers in buying vegetables at the modern market in Jambi City are internal factors that directly have a positive and significant effect on consumer behavior and fresh vegetable variables and internal factors that are moderated by the moderating variable of fresh vegetables have a positive and significant effect on consumer behavior. External factors directly had a positive and significant effect on the moderating variable of fresh vegetables and did not have a significant effect on consumer behavior, as well as external factors that were moderated by fresh vegetables with indicators of product attributes and marketing mix had a positive and significant effect on consumer behavior. The moderating variable of fresh vegetables with indicators of product attributes and marketing mix has a direct positive and significant effect on consumer behavior.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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