

An Empirical Study on the Influence of Dairy Marketing on College Students' Dairy Purchase Intention

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Abstract

Affected by the public health events in 2020, the people's awareness of improving immunity and healthy eating will be further strengthened, and the sales of dairy products and other healthy foods will also increase. The subjects of this paper are college students, combined with the current situation of insufficient development of the college students' dairy market, the questionnaire is issued to understand college students' dairy purchase behaviors, and through factor analysis, in-depth exploration of the sales time The extent of the influence of four types of dairy marketing evaluation variables, sales places, dairy information acquisition channels, and advertisements on college students' willingness to purchase dairy products, and finally, it will provide advice on the development of the dairy market.

Keywords

College students' dairy market; Reliability and validity test; Factor analysis; Dairy marketing.

1. Research Background

1.1. The Importance of the College Student Market to the Dairy Industry

According to the 2020 dairy market research report, compared with previous years, the companies with the most serious decline in dairy sales this year have only 30% of the sales volume of the same period, and even the highest sales companies have only 87.8% of the same period. Combined with this year's national awareness of improving immunity and healthy eating, it is believed that the dairy market will usher in a new climax. In the future dairy market, the research on the dairy market of college students needs to be further carried out.

Although college students' purchasing ability is constrained by economic conditions, college students can become the mainstay of dairy consumption because their living expenses are rising with the living standard and household income. Even if the price of a product rises, it is no longer a problem as the cost of living increases. Contemporary college students also tend to diversify their consumer ideas. To a certain extent, they depend on their own real experience. If a certain product produces a good experience, they will insist on using it, thereby gradually forming a fixed preference, and finally forming a use Habit and maintain good loyalty to this product. And from a long-term point of view, there is a huge profit margin and better development prospects in the college dairy market. If companies can begin to pay attention to the potential target customer group when they are still college students, In order for them to buy the company's products for a long time, a variety of measures are needed to foster loyalty to their brand, then these currently seem inconspicuous Consumer groups will inevitably bring long-term and huge economic benefits to enterprises in the future.

1.2. The Background Reasons for Focusing on the "Packaging" of Dairy Products

The breakthrough point in opening up the college student market lies in understanding the behavioral patterns of college students. Unlike traditional marketing models in the past, college student consumer groups mostly live in college towns. They usually use online shopping instead of supermarket purchases or purchase goods directly on campus. The location, time and method of promoting dairy products have become the key to opening up the dairy market for college students.

1.2.1. Network Media

Mobile phones are now a necessity of college students' daily life. According to the survey, only about 21% of college students use mobile phones for less than 3 hours, and about 34% for 3-6 hours. About 45% of college students spend more than 6 hours on their birthdays, and almost half of college students.

1.2.2. The Advertising Effect of Celebrities Continues to Rise

With the development of the Internet and cultural industries, various celebrities and idols have entered everyone's field of vision, and they are well known and even sought after. And college students who can't do without the Internet are the main force of star chasing. Almost every college student knows the stars in the entertainment circle better, and 90% have their own idols. With the popularity of each excellent TV series or TV series, the sales of products endorsed by the related heroes and heroines have soared under the frenzied purchase of fans.

1.2.3. Restricted Places to Buy

Among college students surveyed, 86.09 percent answered that they went to the supermarket, 55.2% of college students choose to walk to the off-campus supermarket to buy, and 25.92% of college students choose to buy in the school cafeteria. In the survey of the willingness to provide milk delivery services to the dormitory, 66.7% of college students expressed their willingness. As can be seen, the convenience of purchasing processes is also an important factor in students' consumption of dairy products by the impact.

2. Literature Review

In this research project, scholars mostly from the perspective of a particular stakeholder analysis to find factors, but the lack of in-depth exploration of barriers factors, leading to analyze factors showing a large and empty situation, this article should be avoid it. Current research focuses on the macroanalysis of the national dairy market. First-hand data survey conclusions, this article not only combines official data, but also uses a combination of questionnaire surveys and interviews to obtain first-hand data from multiple aspects, statistical analysis using the knowledge to identify the main factors, targeted suggestions for improvement.

3. Data Source

3.1. Determine the Sample Size

To ensure extensive and representative survey, first conducted in the university city of Bengbu City, a pre-survey adopts the form of blocking access, according to the relevant results of the pre-survey, a formal investigation will object to dairy consumption college students, so the formal survey was conducted. The previous sample size determination process focused on the sample variance of the dairy consumption survey of college students. The formula for calculating the optimal sample size n_0 before correction is:

$$n_0 = \frac{u^2 PQ/d^2}{1 + \frac{1}{N} \left[\frac{u^2 PQ}{d^2} - 1 \right]}$$

Using the formula, you can calculate the sample size n_0 , where N is the total number, and when N is large, $n \approx \frac{t^2 PQ}{d^2}$. Taking the value of u when the confidence is 95%, it can be seen that $u=1.96$,

u is the two-sided α quantile of the standard normal distribution, which is the $(\alpha/2)$ quantile of the standard normal distribution with the confidence of $1-\alpha$ number. p is the sample ratio, d is the absolute allowable error, set $d=0.04$. According to a preliminary survey of 50 college students across the province, $p=0.4$. In the actual statistical process, if p is around 0.5, the sample can be estimated based on the population variance reaching its maximum value at $P=0.5$. Therefore, $p=0.5$. The total number of college students N in general colleges and universities in Anhui Province in 2019 is 1.2012 million. Substituting the data, you can use the relevant formula:

$$n_0 = \frac{u^2 p(1-p)}{d^2}$$

The most appropriate sample size for this formal survey is determined to be 600 based on the 95% confidence level. When the absolute sampling error does not exceed the requirement of 4%, the most appropriate sample size for this formal survey is determined.

At the same time, considering that the survey method is a questionnaire survey, it has the characteristics of random sampling. According to the applied statistical theory, taking the overall information related to the purchase and consumption of dairy products by college students in Anhui Province as the content, the formula for determining the sample size can also be:

$$n = \frac{N z_{\frac{\alpha}{2}}^2 \sigma^2}{(N-1)\Delta_{\bar{x}}^2 + z_{\frac{\alpha}{2}}^2 \sigma^2}$$

In this formula: n is the sample size, that is, the overall content of the relevant information; N is the number of college students in Anhui Province; σ -the overall standard deviation; $\Delta_{\bar{x}}$ -the sampling error; $Z_{\alpha/2}$ is the standard normal distribution table $(\alpha/2)$ Corresponding value. Substituting the relevant data above, the most appropriate approximate sample size is 600.

Considering that the questionnaire may not be uploaded due to other factors, such as giving up the questionnaire in the course of its implementation, the result of the questionnaire may not be uploaded in a timely and effective manner. The decision is made after the advice of the instructor and the serious discussion of the team. The final questionnaire was set at 750, assuming a 20% effective ratio.

$$n' = 600 / (1-20\%) = 750$$

3.2. Determine the Sample Distribution

Because there is a difference in the number of colleges in Pingcheng and County-level cities in Anhui Province, the team has conducted stratified sampling in 16 county cities in Anhui

province, $n_p = p_h * n$, which n is the sample size, and p_h is the proportion of the number of college students in each prefecture-level city to the total number of college students in Anhui Province. the number of samples around the city level, as shown in table 1.

Table 1. Sample selection table of 16 prefecture-level cities in Anhui Province

Prefecture-level cities in Anhui Province	The number of ordinary higher education schools	Number of students in school	Number of questionnaires issued
total	110	1139112	750
Hefei City	50	497131	327
Huaibei City	3	38717	25
Bozhou City	2	13035	9
Suzhou City	3	25102	17
Bengbu City	5	61614	41
Fuyang City	5	36823	24
Huainan City	6	59775	39
Chuzhou City	4	53418	35
Luan City	4	36300	24
Maanshan City	5	56125	37
Wuhu City	9	133672	88
XuanCheng City	1	7180	5
Tongling City	3	34062	22
Chizhou City	3	26115	17
Anqing City	5	37413	25
Huangshan City	2	22630	15

The actual situation of the survey was as follows: 682 out of 750 questionnaires were answered. The effective ratio of the questionnaire was 90.93%.

3.3. Questionnaire Reliability Check

For data collection, for those scales or questionnaires designed by researchers based on the research content, reliability and validity must be tested. Because only the tested scales and questionnaires can prove that the quality is up to the standard and the content is effective, the collected data have research significance and analytical value, and the conclusions drawn through statistical integration can explain the actual problems, and thus have practical guiding significance.

According to the 682 results of the preliminary investigation, the satisfaction of the monthly disposable expenses of college students and the way of purchase of dairy products from outside the college is calculated by the Cronbach'alpha formula. The results are as follows:

- (1) Cronbach' alpha value of all variables: 0.824 (between 0.70-0.98 are high confidence)
- (2) The value of Cronbach' alpha of the latent variable

Table 2. Reliability test table of latent variables before improvement

variable	Number of test items	Cronbach'alpha
purchasing power	2	0.531
The product itself	4	0.828
Personal qualities	2	0.684
economic factors	3	0.634
Channel perfect	4	0.863

Table 3. Reliability test table of latent variables after improvement

variable	Number of test items	Cronbach'alpha
purchasing power	3	0.552
The product itself	4	0.828
Personal qualities	2	0.684
economic factors	3	0.634
Channel perfect	5	0.876

In the confirmatory factor analysis purposes, 0.6 is considered an acceptable standard, is preferably 0.7 standard reliability, high reliability belong between 0.70-0.98, and low confidence was less than 0.35, must be rejected . In general, the higher the coefficient, i.e., the higher the reliability of the tool. According to Hair et al suggested that when a measurement item title variable is less than 6, greater than 0.6 also shows that the coefficient data having a high reliability; when there are only 2-3 measurement items for a variable, it is more than 0.5 It means that the data has considerable reliability, because the fewer questions, the lower the reliability coefficient value according to the Cronbach' alpha calculation formula.

Because the variables in this formal questionnaire meet the above indicators (the Cronbach' alpha value of the two variables of product itself and channel improvement are both above 0.8; the Cronbach' alpha value of the two variables of personal traits and economic factors is low, but also reaches It is more than 0.6 to meet the requirements; the variable of purchasing power has a small number of measurement items, which is objectively limited by the calculation formula of Cronbach's alpha value, but it has also reached more than 0.5, which has the basis for continuing analysis), so the survey data has Convincing, the analysis of the survey results can also explain the actual problems. The Cronbach' alpha value of purchasing power increased from 0.531 to 0.552; the Cronbach' alpha value of perfect channels increased from 0.863 Rose to 0.876.

3.4. Questionnaire Validity Test

When researching problems, exploratory factor analysis is often used for validity testing. Although exploratory factor analysis is often used for dimensionality reduction of economic indicators and dimensionality reduction of questionnaire analysis, it has a wide range of uses, but validity analysis in a rigorous sense is still needed to use confirmatory factor analysis.

When doing exploratory factor analysis, scholars often judge whether the item is valid through the load. If the load does not meet the standard, the item is considered invalid, but this is not accurate. Exploratory factor analysis can indeed judge the item through the exploration of dimensions and the load. Whether it is good or not, but the calculation of the effectiveness of convergence and discriminant effectiveness can be realized only through confirmation factor analysis, and the calculation of the effectiveness of convergence and discriminant is impossible. When doing the questionnaire validity test, the complete steps are as follows:

- ① The exploratory factor analysis must be carried out first;
- ② Through the analysis conclusion, clarify the questionnaire dimension division, and delete the items whose factor load does not meet the standard;
- ③ According to the results of the previous exploration factor analysis, the sample was updated, and the analysis of the convergence effectiveness and discriminant characteristics of the scale was carried out with the standard items and dimensions.

Therefore, when testing the validity of the questionnaire, the complete procedure requires three steps. But for scales with known dimensions, when using confirmation factor analysis to test convergence and discriminant, it is not necessary to analyze the exploration factor.

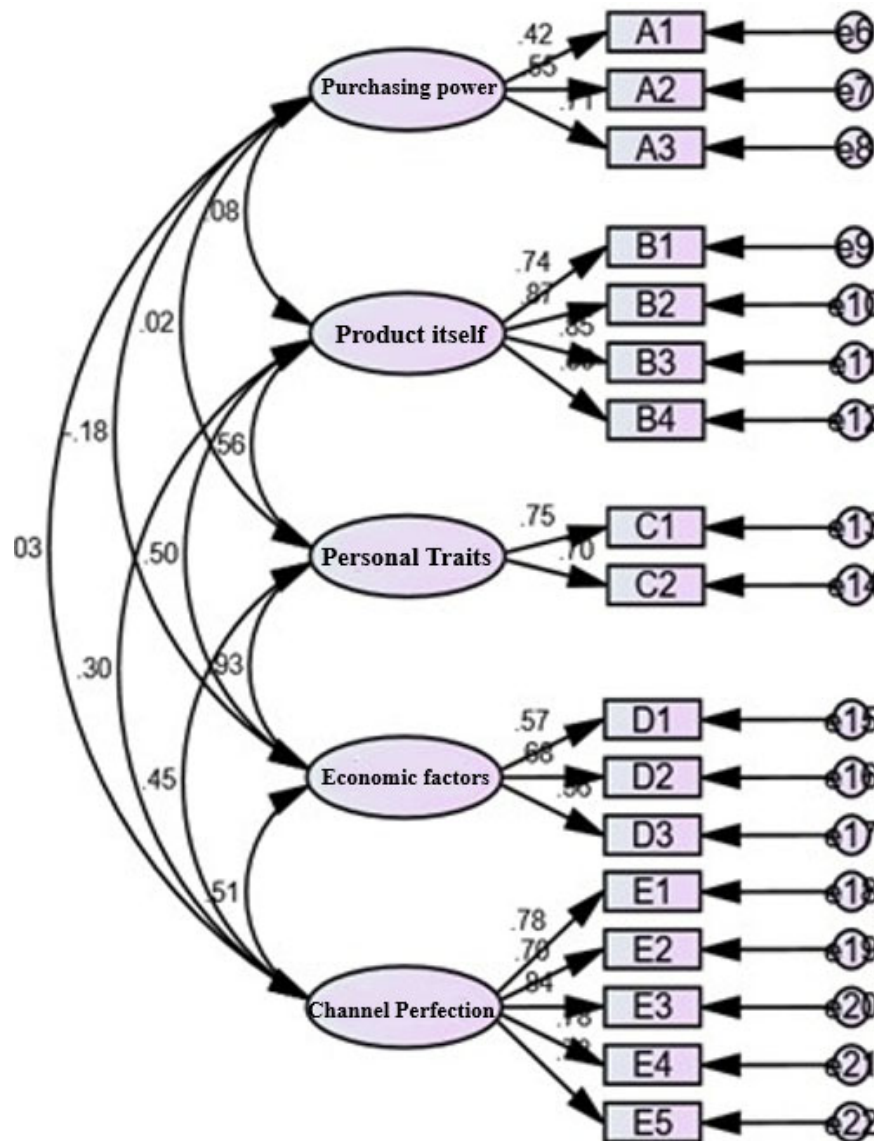


Figure 1. The questionnaire validity test chart

3.4.1. Construct Validity

Table 4. Overall fitting coefficient

X ² /df	RMSEA	NFI	IFI	CFI	PNFI	RFI
4.638	0.071	0.851	0.870	0.869	0.882	0.914

It can be seen from the above table that the value of X²/df is 4.638, which is less than 5, which is acceptable; RMSEA is 0.071, which is less than 0.08, which is acceptable; NFI, IFI, CFI, and PNFI are less than 0.9, but very close, so it is acceptable. RFI It is 0.914, which is greater than 0.9, which can characterize the model, and the result is well-fitted. Taken together, the overall model of the scale for the five dimensions of purchasing power, product itself, personal characteristics, economic factors, and channel perfection fits well.

3.4.2. Convergence Validity

Convergent validity is also known as convergence validity. Among the indicators of convergent validity, Estimate (factor loading) is generally greater than 0.5, AVE (average variance extraction) is generally greater than 0.5, and CR (combined reliability) is generally greater than 0.7. Among them, AVE and CR cannot be directly output through AMOS and need to be calculated separately.

Table 5. Factor loads

	path	Estimate	AVE	CR
A1	<---	purchasing power	0.718	
A2	<---	purchasing power	0.75	0.527
A3	<---	purchasing power	0.709	
B1	<---	The product itself	0.74	
B2	<---	The product itself	0.873	0.595
B3	<---	The product itself	0.853	
B4	<---	The product itself	0.585	
C1	<---	Personal qualities	0.748	0.596
C2	<---	Personal qualities	0.795	
D1	<---	economic factors	0.767	
D2	<---	economic factors	0.675	0.538
D3	<---	economic factors	0.755	
E1	<---	Channel perfect	0.778	
E2	<---	Channel perfect	0.697	
E3	<---	Channel perfect	0.839	0.589
E4	<---	Channel perfect	0.783	
E5	<---	Channel perfect	0.731	

It can be seen from the above table that the factor load estimates for each topic corresponding to the five latent variables of purchasing ability, product itself, personal characteristics, economic factors, and channel improvement are all greater than 0.5, indicating that the five latent variables correspond to the topic with high Representative. In addition, the mean square difference of each potential variable was extracted with AVE greater than 0.5, and the comprehensive reliability CR greater than 0.7, suggesting that the effectiveness of convergence was ideal.

3.4.3. Discrimination Validity

Latent variable correlation between the latent variables to be significant, and between the latent variables and the correlation coefficient is lower than the latent variable average variance of the square root extraction amount AVE.

Table 6. Discrimination validity

	purchasing power	The product itself	Personal qualities	economic factors	Channel perfect
purchasing power	0.527				
The product itself	0.281***	0.595			
Personal qualities	0.32***	0.46***	0.596		
economic factors	0.278***	0.498***	0.432***	0.538	
Channel perfect	0.326***	0.299***	0.449***	0.41***	0.589
AVE square root	0.726	0.771	0.772	0.733	0.767

Note: *** means that the p value is less than 0.01, and there is a significant correlation between the latent variables; the diagonal line is the average variance extraction amount AVE

It can be seen that the different latent variables among the five latent variables of purchasing power, product itself, personal characteristics, economic factors, and channel improvement have significant correlations ($p < 0.01$); Further, the correlation coefficient between the different latent variables: the absolute value of less than 0.5, below the square root of the corresponding AVE, it indicates that there is a degree of difference between potential variables, and the discriminant effectiveness of the scale data is ideal.

4. Comprehensive Evaluation of College Students' Dairy Purchase Intention Based on Factor Analysis

4.1. Research Ideas

Students' willingness to buy dairy products The questionnaire identifies the main factors affecting their willingness to buy dairy products through factor analysis. After the original data collected preliminary order, using the basic principles and methods of software IBM-SPSS statistical factor analysis of the selling time, selling places, dairy obtain information channels, advertising 4 appraisal variable statistical correlation analysis (see table 1), feature vector by sampling data, eigenvalues and cumulative contribution rate is extracted two common factors, and willingness to buy dairy quantified assessment of students on this basis.

Table 7. Variable description table

Variable description	meaning
Sale time	Breakfast=6, Lunch=1, Dinner=4, Between Breakfast and Lunch=2, Between Lunch and Dinner=3, Before Bedtime=5, Any Time=7
Advertising	Very dissatisfied=1, dissatisfied=2, general=3, satisfied=4, very satisfied=5
Channel source	Advertising media=6, store promotion=4, packaging description=3, friend recommendation=2, own experience=5, others=1
Sales place	School cafeteria=8, school supermarket=7, off-campus supermarket=6, online shopping=5, takeaway=4, order=3, vending machine=2, others=1

4.2. Research Methods

4.2.1. KMO and Bartlett Test

KMO test and Bartlett sphericity test can be used to verify whether the selected index sample data can be applied to factor analysis. Specifically, if the KMO test value is greater than 0.5 or the Bartlett sphericity test P value is less than 0.05, the test can be passed. Apply this method. In our statistical table of sample data, the calculated KMO result is 0.598, indicating that the sampling data can be analyzed by factor analysis. At the same time, the importance of passing the Bartlett ball test is 0.000 to show that the sample data are statistically significant.

Table 8. KMO and Bartlett test structure

KMO and Bartlett test		
Kaiser-Meyer-Olkin measures the adequacy of sampling.		0.598
Bartlett's sphere test	Approximately Chi-square	155.709
	df	6.000
	Significance	0.000

4.2.2. Determine the Number of Factors

The picture shows the variance contribution of the matrix, including the initial and the characteristic root factor variance contribution. Laid-collection sub-root of the first main component 1.564, corresponding to a cumulative variance contribution rate of 39.101%; wherein of second main component is 1.008, corresponding to a cumulative variance

contribution rate of 64,293%. When selecting a common characteristic root factor, usually required characteristic root ≥ 1 , this analysis ≥ 1 root meets the characteristics of two common factor, which corresponds to the cumulative variance contribution are 64.293%. Comprehensive consideration will extract 2 Common factors are analyzed.

Table 9. Factor analysis structure

Total stated variance								
element	Starting eigenvalue			Load the sum of squares			Cyclic sum of squares loading	
	statistics	mutated%	Accumulate%	statistics	mutated%	Accumulate%	statistics	mutated%
1	1.564	39.101	39.101	1.564	39.101	39.101	1.544	38.612
2	1.008	25.193	64.293	1.008	25.193	64.293	1.027	25.681
3	0.789	19.717	84.010					
4	0.640	15.990	100.000					

4.2.3. Solution and Rotation of Factor Loads

"Element matrix" and "rotating element matrix" are the factor loading matrix before and after rotation respectively. The factor loading reflects the degree of correlation between factors and variables. From the figure, it can be seen that the two common factors after rotation and the original variables The relationship has become clearer. Factor 1 has a larger factor load on the three variables except "What are the main sources of information about dairy products?", and factor 2 has a larger factor load on "If the advertisement does not reflect the production process of the product." The "and technology" variable has a large factor load, so the two factors can be defined as channel factor and advertising factor respectively, so that the information of the original four evaluation indicators can be better distinguished.

Table 10. Solution and rotation of factor loads

Rotating element matrix		
	element	
	FAC1	FAC2
Where do you choose to buy dairy products during school	0.599	0.300
If the production process and technology of the product are not reflected in the advertisement	0.002	0.964
What are your main sources of information about dairy products?	-0.762	0.085
Your usual preferred time to drink dairy products	0.778	-0.019

4.3. Result Analysis

In order to evaluate the students' willingness to buy dairy products, the coefficient fraction is calculated as variable value by weighting the difference sharing ratio normalizing the common factor.

$$FAC = \frac{0.38612 \times FAC1 + 0.25681 \times FAC2}{0.38612 + 0.25681}$$

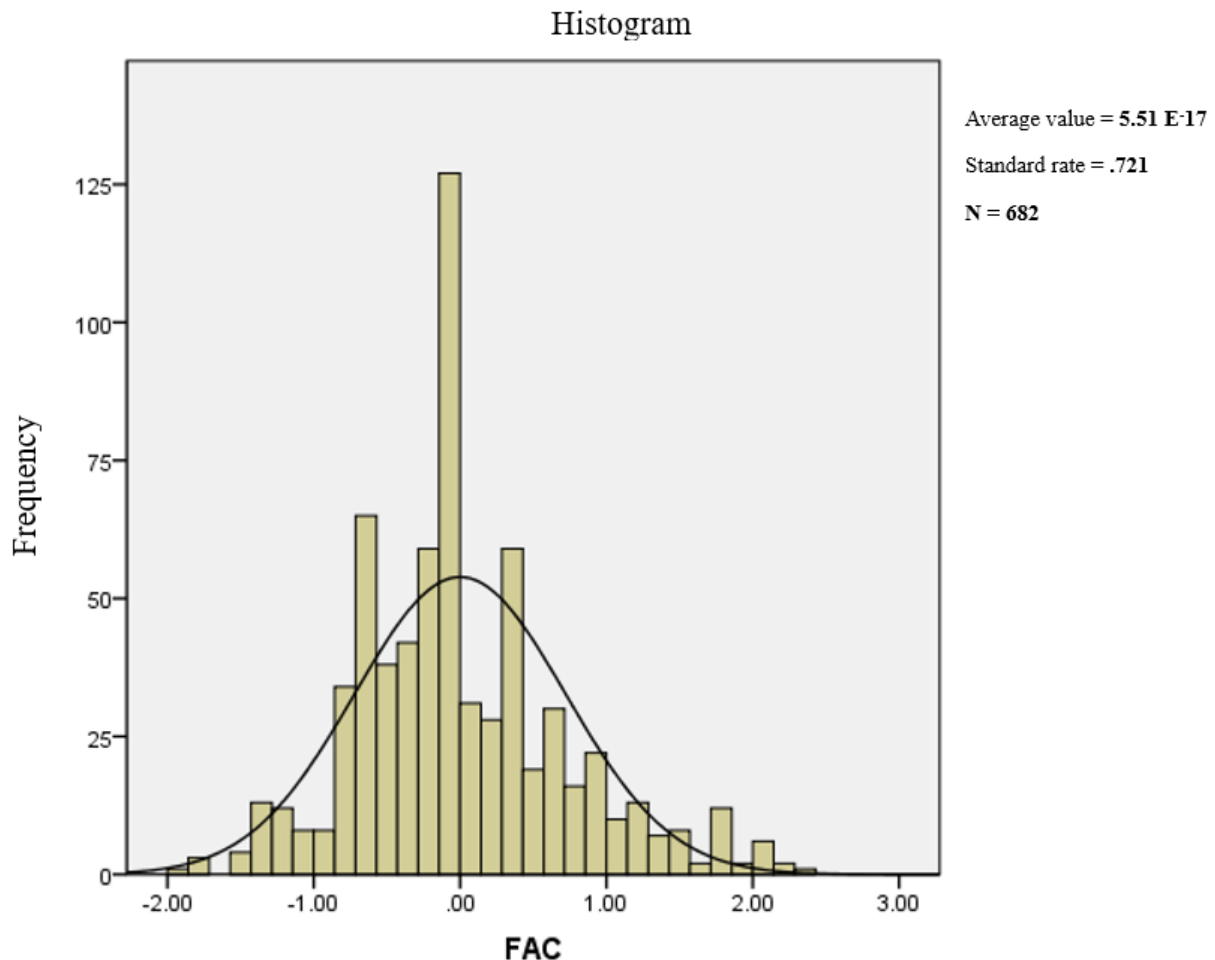


Figure 2. Histogram of comprehensive scores of college students' dairy purchase intentions

Through 2 public factors and frequency in descriptive statistics, the comprehensive scores (FAC) of college students are counted, combined with histograms, and the analysis results are as follows: First, advertising has a more obvious role in the four influencing factors; then, the sales time and location are more important in dairy marketing; finally The source of dairy information channels does not affect the purchase of dairy products by college students. This direction can be appropriately downplayed in product marketing. College students have a normal distribution of the comprehensive scores of dairy purchase intention. There are more college students with a comprehensive score of -1 to 1 for dairy purchase intentions, and relatively few college students with scores of 1-2 or 1-2. Available innovative marketing methods have a good effect on most college students.

5. Conclusions and Recommendations

Based on the results of the above data analysis, Advertising campaigns play an important role in this study, choosing the right time for sale, and the right place for sale. Next, detailed suggestions will be made for each aspect:

5.1. Innovative Forms of Advertising

When you enter college sales, you should "go home and do what you like." Carrying out dairy marketing competitions in many colleges and universities, rapidly increasing the visibility of dairy products on campus, taking this opportunity to introduce the scientific nutritional concepts of dairy products to college students, and create continuity of dairy product consumption; dairy product packaging launches DIY new product series for consumption

Participants are also involved, such as leaving a message to participate in the packaging style of the new product, celebrity endorsements, etc., and even the packaging part is left blank, which can be written, pasted, painted, etc., so that consumers can feel the "zero distance" between their daily dairy products and themselves. Cooperate with students in the college student incubation base on campus, specifically for the size of dairy sales, including updating shelves, machine cleaning and maintenance, publicity work, etc. Or contract to a college student incubation base and dispatch a special person for management guidance. Another good way for school-based enterprise cooperation is to enhance the company's reputation and nurture talent.

5.2. Cooperative Development Between Dairy Companies and Canteens

According to the questionnaire and analysis, most college students like to drink dairy products during or after dinner. Therefore, they can learn from the marketing model of various milk tea shops and sell them in dining halls and other gathering places. Products, will increase the comfort level of consumption, this dairy packaging and selling method is convenient and meets healthy eating habits.

5.3. Retail Outlets Such as Vending Machines Enter the Campus

At present, the campus and the surrounding area are the main consumer area for college students, combined with different purchase methods (may be purchased by box), so it is particularly important to set up retail outlets on campus to provide more detailed services, such as delivery of dairy products to the bedroom and classrooms. Services, etc., will greatly improve consumer comfort; the products in the established vending machines are mainly hot products, new products, popular celebrity endorsements or dairy products named by popular programs. This part is sold as single products. This method can be used Promote new products and lead the consumption trend.

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