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Increasing the value of jackfruit cobs as agricultural waste materials for syrup production by enzymatic hydrolysis using pectinase and cellulose

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ABSTRACT

This research aimed to investigate the optimal working conditions for pectinase and cellulase, evaluate the quality of jackfruit cob syrup, and assess its physical and chemical properties and consumer acceptance. The study began with exploring the optimal conditions for syrup production from jackfruit cobs. The factors studied were the amount of pectinase in 3 levels: 0.04, 0.06, and 0.08%; the amount of cellulase in 2 levels: 0.1 and 0.2%; and the incubated temperature in 3 levels: 40, 45, and 50 °C; the incubated time in 3 levels: 30, 90, and 150 minutes. All 54 conditions were obtained in Factorial experiments in Completely Randomized Design (CRD). The physical and chemical properties were analyzed, and the optimal conditions were determined through hierarchical clustering, along with evaluating the physical and chemical properties and consumer acceptance. It was found that the optimum conditions for extraction of jackfruit cob juice include 0.08% pectinase, 0.2% cellulase, incubated temperature at 40 °C, and a curing time of 90 minutes, respectively. The properties of jackfruit cob syrup were as follows: brightness (L*) of 22.77 ±0.04, (a*) of -0.74 ±0.06, and (b*) of 9.16 ±0.43. The light transmittance was 1.99 ±0.01, viscosity was 14.00 ±0.05 centipoise, and pH was 4.75 ±0.10, indicating prebiotic properties. The overall liking score was 7.96. After being informed about the nutritional benefits of jackfruit cob syrup, 85.00% of consumers indicated a willingness to purchase the product. It will add value to the waste jackfruit cob in agriculture to 86 baht per kilogram. Therefore, jackfruit cob syrup is a value-added product that enhances the utilization of agricultural by-products, reduces agricultural waste, and meets consumer demand for healthy food options.

Keywords: Value added, Syrup, Jackfruit cob, Agricultural waste, Prebiotics

INTRODUCTION

Jackfruit is an important economic fruit in South and Southeast Asia. According to jackfruit planting statistics in 2020, there were 2,646,918 rai of jackfruit planting areas in Asia with a yield of 388,471.42 tons per year. Its scientific name is *Artocarpus heterophyllus*, belonging to the Moraceae family. Most consumers prefer to eat fresh jackfruit meat. It is processed at an industrial level, such as ice cream, jackfruit in syrup, canned jackfruit, dried jackfruit, crispy jackfruit, jackfruit jam, etc. As for jackfruit seeds, the utilization is still minimal. Jackfruit seeds are primarily boiled for consumption as a snack or processed into jackfruit seed flour. Steamed jackfruit bark and cob are utilized in animal feed and bio-fertilizer production. However, a significant amount of waste still remains from jackfruit consumption. Jackfruit cob then becomes waste, causing an impact on the environment, being a breeding ground for insect disease carriers, and polluting the environment, causing health problems, economic loss, and so on [1]. Jackfruit cob has a unique aroma. It has a sweetness level of 22 degrees Brix. This fruit contains important nutritional values, including carbohydrates in the form of oligosaccharides and polysaccharides. These carbohydrates function as prebiotics, supporting gut health by preventing and alleviating symptoms of gastrointestinal infections. They also strengthen the immune system, support digestion, and enhance the absorption of nutrients into the body. Additionally, jackfruit cob aids in fat metabolism and helps reduce LDL cholesterol levels. It is also rich in calcium, phosphorus, iron, vitamin B1, and vitamin B2 [2]. At present, the concept

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of adding value to waste after processing agricultural products is a way to increase income for farmers and various entrepreneurs in the agribusiness system [3]. It is also a guideline for developing and promoting environmentally friendly agriculture by promoting the use of agricultural waste to be processed into other products in order to add value to agricultural products.

Fruit syrup is a product processed from fruit. It is a food preservation method that uses high-concentration sugar mixed with fruit juice. The syrup is liquid with high viscosity. The color of the syrup may look cloudy or clear, and it may smell of fruit. Syrup is used in food products, beverages, desserts, milk, and ice cream, as a sweetener, flavoring agent, and decorating food products to attract consumers [4]. Therefore, syrup is a primary source of drinks, milk, food, and snacks. Currently, syrup demand in Asia is distributed as follows: 52% for the food industry, 19% for the chemical and pharmaceutical industry, 2% for import packaging and distribution, and 27% for other purposes. The import in the food industry is 52 percent, which is worth about 2,106 million US dollars or about 66,469 million baht, which is the result of the world's population increasing to 7.7 billion people in 2019 from 6.1 billion people in 2000 and the demand for syrup from other industries (food and beverages) increases.[5] Food syrup is a sweetener that is safer for health than sugar, which is high in antioxidants and helps slow down aging. It also reduces the risk of serious diseases such as diabetes, heart disease, cancer, and atherosclerosis, as well as various brain-related diseases. It also helps digestion, reduces gas in the stomach, flatulence, and constipation, and helps to strengthen the body's immunity [6].

Therefore, this research aims to explore the syrup production process to enhance the value of agricultural products, reduce agricultural waste, and meet consumer demand for healthy food options.

MATERIALS AND METHODS

1. Raw material preparation

Ripe jackfruit cobs with a yellow color and fragrant aroma are used to prepare jackfruit cob juice. The cobs are first separated from the jackfruit skins, and any bruised cobs are removed. Then the good ones will be washed thoroughly with clean water. The jackfruit cobs are inhibited for the browning reaction with boiling steam at atmospheric pressure for 10 minutes and then quickly cooled. The jackfruit cobs are centrifuged with the pulper and finisher for fruit juice extraction and separation at a speed of 200 rpm and the spin time is 5 minutes. The quality is analyzed, including pH value using a pH meter, the percentage of light transmittance of 650 nm., the content of dissolved solids using a refractometer, and the percentage of yield (% Yield).

2. Study of optimum working conditions of pectinase and cellulase

The optimal conditions for pectinase and cellulase were studied. There were 4 factors studied: the amount of pectinase at 3 levels: 0.04, 0.06, and 0.08 [7,8]; the amount of cellulase at 2 levels: 0.1% and 0.2% [9]; the incubated temperature at 40, 45, and 50 degree Celsius [7,10,11] ; and the incubated time at 3 levels: 30, 90, and 150 minutes [12,10]. The experiment was planned using factorial in CRD. A total of 54 production conditions were obtained. The prepared jackfruit cobs were digested with pectinase and cellulase according to the specified conditions, and then the enzyme reaction was stopped by immersing them in boiling water for 10 minutes and cooling rapidly. The extracted jackfruit cob juice was processed in a centrifuge separator at 2,000 rpm for 20 minutes. The crystal was separated and analyzed for quality as follows:

2.1 The physical properties include the yield percentage (% Yield), which is determined by precipitating jackfruit cob juice using pectinase and cellulase. The yield is calculated according to Equation 1.

$$\text{Percentage of yield (\% Yield)} = \frac{\text{Weight of extracted jackfruit cob juice}}{\text{Weight of initial jackfruit cob}} \times 100 \quad (1)$$

2.2 Find color value using Hunter Lab and light transmittance using UV/VIS Spectrophotometer of 650 nm.

2.3 Chemical properties include pH value measured using a pH Meter and soluble solids measured using a Hand Refractometer. Afterward, suitable experimental subjects were selected by considering physical properties such as brightness and light transmittance using Hierarchical Clustering and the maximum light transmittance for producing jackfruit cob syrup.

3. Study on the quality of jackfruit cob syrup

Concentrate the jackfruit cob juice from the group with the highest brightness value and light transmittance using vacuum evaporation 1 atm at 60 °C until it reaches 65 degrees Brix. Then, analyze its quality as follows:

3.1 Physical properties include %yield, color value measured by Hunter Lab, light transmittance measured by UV/VIS Spectrophotometer, and viscosity measured by Brookfield Digital Viscometer.

3.2 Chemical properties include pH value measured by using a pH meter.

3.3 Consumer preferences were studied by planning a randomized complete block design (RCBD)

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with a 9-point Hedonic Scale method for appearance, color, clarity, jackfruit smell, flavor, and overall preference. The sample comprised 100 consumers aged 20 years and over in Rajamangala University of Technology Thanyaburi, Pathum Thani Province.

4. Study on physical and chemical qualities and consumer acceptance of jackfruit cob syrup

4.1 The physical properties include color values measured using a Hunter Lab colorimeter, light transmittance measured with a UV/VIS spectrophotometer, and viscosity measured using a Brookfield Viscometer (Model DV1) from AMETEK.

4.2 Chemical qualities include pH value measured by using a pH Meter.

4.3 For prebiotic properties, prepare 1 ml of jackfruit syrup and add 9 ml of 0.85% sodium chloride (NaCl) solution. Shake to obtain a dilution level of 10^{-1}. Dilute the sample from 10^{-2} - 10^{-6} or according to appropriateness by pipetting 1 mL of prepared sample (10^{-1}) into 9 mL of 0.85% NaCl solution, shaking well. Pipette 0.1 mL of each dilution onto Lactobacillus MRS agar. Spread the samples over two Petri dishes with a glass rod. The Petri dishes are incubated at 35 degrees Celsius for 24 hours. If no colonies are observed, incubation is extended for an additional 24 hours. Colonies are counted on dishes with a colony range of 25 to 250.

4.4 A study of consumer acceptance towards jackfruit cob syrup was done by using a 9-Point Hedonic Scale (a score of 1 means dislike the most and 9 means like the most). In terms of appearance, color, clarity, viscosity, jackfruit smell, sweet taste, jackfruit flavor, and overall preference by testing with 100 consumers aged 20 years and over in the area of Rajamangala University of Technology Thanyaburi, Pathum Thani Province.

RESULTS AND DISCUSSION

1. Raw material preparation

According to raw material preparation, it was found that the jackfruit cob that was used to separate the pulp jackfruit cob juice looked turbid with some pulp and fiber, the light transmittance percentage (Transmittance 650) was 0.1, pH was 3.60, percentage of yield (% yield) was 21.3, and had sweetness of 20 degrees Brix. The sweetness of jackfruit flesh is 20 - 23 degrees Brix [7].

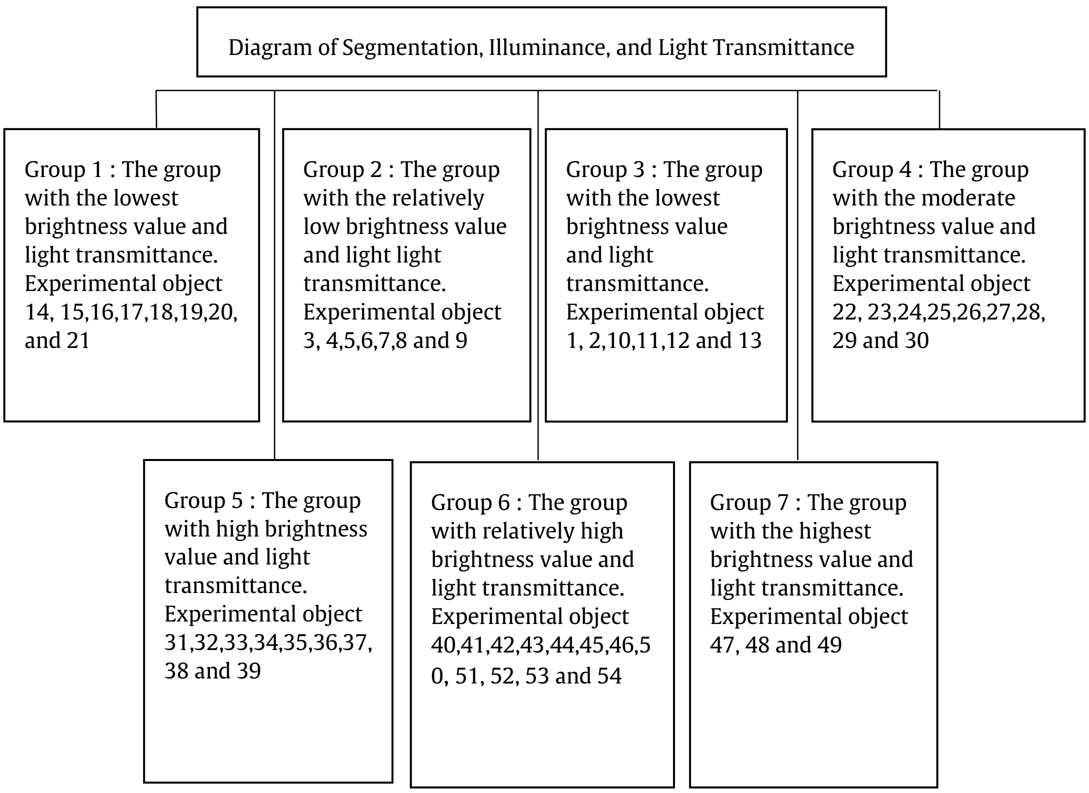

Figure 1 Segmentation Diagram.

2. Study of optimum working conditions for pectinase and cellulase

Study of optimum working conditions for pectinase and cellulase on quality of jackfruit cob juice. After the jackfruit cob juice is treated with pectinase and cellulase under 54 different conditions, the enzyme reaction is halted by immersing the mixture in boiling water for 10 minutes, followed by rapid cooling. After that, the jackfruit cob juice was extracted in the pulper and finisher for fruit juice extraction and separation (2,000 rpm) for 20 minutes, separated, and analyzed for quality. It was found that the percentage of yield

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(% yield) was between 39.00 - 41.00. The luminosity (L*) was between 32.65 - 33.80. The light transmittance was between 1.12 -1.15. The pH was between 3.60-3.75. The soluble solid was between 19-21 degrees Brix. The appropriate experimental group was then analyzed and selected based on the study of physical properties, including brightness and light transmittance. The obtained data were analyzed and grouped according to their abilities to select the optimum condition for producing syrup from jackfruit cob using Hierarchical Clustering, in which targets in the same group are similar in 2 factors or variables, including brightness and light transmittance for use in the next step of the study as shown in Figure 1.

According to Figure 1, the segmentation diagram using Hierarchical Clustering, it was found that the brightness values and the light transmittance values can be divided into 7 groups. The group that the researcher was interested in was group 7, with the highest brightness value and light transmittance in 3 conditions: 47,48 and 49, which have brightness values of 32.63, 32.62, and 33.81, respectively, and the light transmittance values are 1.13, 1.13, and 1.13, respectively. Brightness and light transmittance are caused by pectinase breaking down pectin compounds. Pectic acid causes plant cells to break down, leading to pectin degradation in the fruit. This process allows colloidal protein molecules and pectin to form large complexes that precipitate, thereby increasing the clarity of the fruit juice. Additionally, cellulase digests cellulose or the fruit's cell wall, breaking it down until sugars dissolve in water and are absorbed into the cell interior as a carbon source, which enhances juice extraction. As a result, jackfruit cob juice exhibits favorable physical properties [12]. Using 0.08% pectinase and 0.2% cellulase breaks down pectin in the cell wall and middle lamella, releasing more water and decreasing viscosity. This is consistent with the research of [13], which found that the concentration of pectinase and curing time can increase the yield of strawberry juice was statistically significant ($p \leq 0.05$). This aligns with the findings of [7], which reported that increasing the ratio of pectinase to ground jackfruit pulp during the production of jackfruit syrup led to a higher syrup yield. Statistical analysis revealed that when the pectinase ratio exceeded 0.06% (v/w), a significant increase in the volume of jackfruit syrup was observed ($p \leq 0.05$). Consequently, a pectinase concentration of 0.08% (v/w) was selected for treatments 47, 48, and 49 [14] . Additionally, the combined use of pectinase and cellulase facilitates the breakdown of fruit cell walls, enhancing juice extraction and improving the physical properties of the fruit juice. The study found that the curing temperature is higher when the amount of pectinase and cellulase increases and the duration is extended. Thus, there is a positive effect on the physical properties of the syrup, which pectinase serves to decompose pectin in fruit pulp, resulting in higher juice clarity and extraction [15], and cellulase-degrading enzymes that catalyze the degradation of beta 1,4 bonds, glycosidic within the molecular structure of the smallest unit of cellulose to be decomposed entirely to obtain glucose and extract clearer fruit juice [7], so brightness and light transmittance or clarity is higher. Thus, Group 7 was selected because of the highest brightness value and light transmittance values in 3 conditions.

3. Production of syrup from jackfruit cob

The conditions in group 7 were selected to produce jackfruit cob syrup by using vacuum evaporation at a temperature of 60 degrees Celsius until the sweetness is 65 degrees Brix, and analyzing the physical properties, including color value, light transmittance, viscosity, and chemical qualities (pH). The results are shown in Table 1.

Table1 Physical quality and Chemical of syrup from jackfruit cob.

Quality	Condition 47	Condition 48	Condition 49
Physical quality			
Color value (L*)	22.77a ±0.04	20.27c ±0.05	20.59b ±0.04
a*	-0.74b ±0.06	-0.96c ±0.06	-0.07a ±0.06
b*	9.16b ±0.43	7.46c ±0.43	9.90a ±0.43
Transmission (%T650)	1.99a ±0.01	1.90b ±0.01	1.87c ±0.02
Viscosity (cP)	14.00c ±0.05	16.00b ±0.01	17.50a ±0.15
Transmission (%T650)	22.77a ±0.04	20.27c ±0.05	20.59b ±0.04
Chemical quality			
Acid - base (pH)	4.75a ±0.10	4.48b ±0.12	4.29c ±0.11

Remark: Different letters in vertical is difference at 95% ($p \leq 0.05$)
^{ns} No statistically significant differences ($p \geq 0.05$)
^{a,b,c} Average in vertical which have alphabets control statistically significant ($p \leq 0.05$)
± Standard deviation.
Condition 47: Pectinase 0.08 Cellulose 0.2 temperature used for the curing 40 °C about 90 minutes.
Condition 48: Pectinase 0.08 Cellulose 0.2 temperature used for the curing 40 °C about 150 minutes.
Condition 49: Pectinase 0.08 Cellulose 0.2 temperature used for the curing 45 °C about 30 minutes.

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According to Table 1, the color brightness (L*) of jackfruit cob syrup was analyzed, and it was found that condition 47, which used 0.08% pectinase and 0.2% cellulase, treated at 40°C for 90 minutes, produced the best results. The color brightness (L*) was significantly the highest ($p \leq 0.05$). The brightness (L*) of jackfruit cob syrup was lower than that of jackfruit juice treated with pectinase and cellulase. This reduction in brightness is attributed to the evaporation temperature, which promotes the Maillard reaction between carbohydrates and amino acids. This reaction is a key chemical process responsible for the distinctive taste, aroma, and color observed in many processed foods. By changing the color of food, the carbonyl group of the sugar reacts with the amino group of the amino acid to form glycosylamine (N-substituted Glycosylamine) and water. Unstable glycosylamine then rearranges through Amadori Rearrangement and forms into Amadori compounds, which such compounds can react in many ways. This leads to the formation of compounds that give the melanoidins, which make the syrup browner [16] This is consistent with [12] research, which found that high temperature with longer curing time results in more browning of the syrup and lower brightness due to high temperature and longer time which cause a color change. This forms a brown compound, a Maillard reaction and is in the red to green (a*) region. The negative value indicated that the jackfruit cob syrup was greener than reddish. Therefore, it gives a yellowish appearance to jackfruit cob syrup. The pigment called Flavonol is found in yellow fruits and vegetables [14].

According to the percentage of light transmittance of syrup from jackfruit cob, it was found that condition 47 used 0.08% of pectinase and 0.2% of cellulase, cured at 40 degrees Celsius for 90 minutes significantly ($p \leq 0.05$). The percentage of light transmittance of syrup from jackfruit cob was higher than that of jackfruit juice precipitated with pectinase and cellulase because the curing time affects the clarity or light transmittance. The curing temperature and time affected the extracted dissolved solids content and clarity or light transmittance [13].

According to the viscosity (cP) of jackfruit cob syrup in Table 1, it was found that condition 47 used 0.08% pectinase and 0.2% cellulase, cured at 40 degrees Celsius for 90 minutes, significantly lowest viscosity ($p \leq 0.05$) due to pectinase curing time, and cellulase liquefaction that is almost complete, i.e., the pectinase that decomposes the pectin in the fruit into smaller molecules dissolves into the liquid part. It works when plant cells are torn or affected [8], and cellulase acts to catalyze the degradation of beta 1,4 bonds Glycosidic acid within the molecular structure of cellulose is the smallest unit [8], thus resulting in a low viscosity of jackfruit cob syrup.

According to the pH values of the jackfruit cob syrup shown in Table 1, it was found that under condition 47, where 0.08% pectinase and 0.2% cellulase were incubated at 40°C for 90 minutes, the highest pH value was 4.75 ($p \leq 0.05$), which is classified as a low pH value. The pH values ranged from 4.73 to 4.80, categorizing the syrup as a low-acid food. However, during production, the process involves heat treatment to destroy or inhibit the growth of spoilage-causing and pathogenic microorganisms, ensuring preservation and an extended shelf life [17].

4. Study of consumer preference towards syrup from jackfruit cob

Consumer preferences were evaluated using a 9-point hedonic scale with a sample of 100 consumers. The assessment covered appearance, color, clarity, jackfruit aroma, flavor, and overall preference. The results are presented in Table 2.

According to Table 2, it was found that the syrup from jackfruit cob from all 3 conditions had significantly different scores of consumer preference ($p<0.05$) in terms of appearance, color, clarity, jackfruit smell, jackfruit flavor, and overall preference. The jackfruit syrup from condition 47 got the highest score in terms of appearance, color, clarity, jackfruit smell, flavor, and overall preference because the syrup from the jackfruit cob is clear. The clarity or brightness of the syrup product is affected by the Maillard reaction. It depends on temperature, time, and pH value. In general, high temperatures and long periods increase the Maillard reaction.

Table 2 Physical quality and Chemical of syrup from jackfruit cob.

Sensory products (Character)	Condition 47	Condition 48	Condition 49
Apperance	7.23a ±1.18	6.72b ±1.06	6.48b ±1.34
Color	7.32a ±1.14	6.81b ±1.06	6.84b ±1.35
Transparency	7.24a ±1.01	6.82b ±1.07	6.89b ±1.29
Jackfruit smell	7.16a ±1.53	6.65b ±1.42	6.47b ±1.70
Jackfruit flavor	7.31a ±1.38	6.68b ±1.35	6.62b ±1.40
Overall preference	7.43a ±1.01	6.78b ±1.01	6.65b ±1.23

Remark: Condition 47: Pectinase 0.08 Cellulose 0.2 temperature used for the curing 40 °C about 90 minutes.
Condition 48: Pectinase 0.08 Cellulose 0.2 temperature used for the curing 40 °C about 150 minutes.
Condition 49: Pectinase 0.08 Cellulose 0.2 temperature used for the curing 45 °C about 30 minutes.

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5. Study on the physical qualities of jackfruit syrup products

The study on the physical properties of jackfruit syrup products includes % yield, color value, light transmittance, and viscosity, while the chemical properties include pH and prebiotic characteristics. The experimental results are presented in Table 3.

Table 3 Physical quality Chemical and Prebiotic of jackfruit cob syrup.

Quantity	Quantity
Physical quality	
%yield	12.00
Brightness (L^*)	22.77
Transmission (%T650)	1.99
Viscousity (cP)	14.00
Chemical quality	
Acid - Base (pH)	4.75
Prebiotic microorganism quality (CFU/g)	
Jackfruit syrup	3.8×10^6

According to Table 3, the physical qualities were analyzed and found to include a %yield of 12.00, color lightness (L^*) of 22.77, light transmittance of 1.99, and viscosity (cP) of 14.00 when using 0.08% pectinase and 0.2% cellulase, treated at 40°C for 90 minutes. The results showed that the curing temperature significantly affected brightness, temperature, and curing time, influencing the extracted dissolved solids and the clarity or light transmittance. [14]. There is a pigment called flavonol found in yellow fruits and vegetables. The chemical qualities, including pH value, was 4.75, which has a weak acidity value. It was found that a pH range of 4.73 to 4.80 does not classify the product as a high-risk food for microbial growth, which could cause spoilage or support pathogenic microorganisms. This pH range contributes to food preservation and extends shelf life [10].

According to the prebiotic properties analysis of jackfruit cob syrup products by studying the syrup from jackfruit cobs used as food for microorganisms, Lactobacillus sp., which is a probiotic microorganism [19]. According to Table 4, it was found that syrup from jackfruit cobs contained the amount of Lactobacillus sp., which equals 3.8 x 10^6 colonies per gram. It is considered to have prebiotic properties. Generally, the optimal amount of probiotic bacteria in a product is at least 10^6-10^7 colonies per gram. This showed that it was not a prebiotic [18] that could affect the microbial balance within the gastrointestinal tract and inhibit the growth of pathogenic microorganisms (Pathogens) in the gastrointestinal tract that cause food diarrhea. Prebiotics are not digested or absorbed in the gastrointestinal tract. It is a nutrient that stimulates the growth of specific probiotics and can change the ratio of microorganisms to make good health [19]. Therefore, syrup from jackfruit cobs is classified as a prebiotic food.

6. Study of consumer acceptance of syrup from jackfruit cob

A study of consumer preferences towards the product used 9-point Hedonic Scale for appearance, color, clarity, viscosity, jackfruit smell, sweet taste, jackfruit flavor, and overall preference was done by testing with 100 consumers. It was found that the consumers rated their preference in terms of appearance, color, clarity, viscosity, jackfruit smell, sweet taste, jackfruit flavor, and overall preference. The consumer acceptance level was moderate, with a mean score of 7.79 ±0.26. Approximately 85% of consumers expressed a willingness to purchase jackfruit cob syrup due to its distinctive characteristic - the unique flavor of jackfruit. Additionally, its nutritional value was a key factor influencing purchase decisions, as modern consumers are increasingly focused on health and well-being, including physical, emotional, and mental health. Moreover, the production of jackfruit cob syrup supports the agricultural sector by adding value to agricultural by-products [20].

7. Study of production cost of jackfruit cob syrup

According to the study of the cost of producing jackfruit cob syrup by calculating the cost of producing jackfruit cob syrup consisting of direct raw materials, the overhead cost is 35% of the raw material price. It was found that 1 liter of jackfruit cob syrup costs 170.17 baht. If a profit of 50% of the cost price is added, the selling price per liter of jackfruit cob is 255.26 baht, which is cheaper compared to commercial products. Which is cheaper than commercial products, with 1 liter priced at 650-690 baht. Since the syrup from the jackfruit cob use raw materials that are waste, the cost of production is low, adding value to the product. In addition, jackfruit cob syrup retains its unique aroma, sweetness, and nutritional value, including protein, carbohydrates, calcium, phosphorus, iron, vitamin B1, and vitamin B2 [2]. It is considered an alternative that creates economic value that will benefit the agricultural industry more.

CONCLUSIONS

According to the study of the optimum conditions for the production of syrup from jackfruit cob, it was found that extraction requires 0.08% of pectinase, 0.2% of cellulase, curing temperature of 40 degrees Celsius, and curing time of 90 minutes. Physical qualities include the lightness of the product. The mean was 22.77 ±0.04 percent of the light transmittance of the product. The average value was 1.99 ±0.01. The viscosity of the product had an average value of 14.00 ±0.05 centipoise. The chemical properties included a pH value of 4.75 ±0.10. Consumers rated their overall preference

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with an average score of 7.96 ±0.62. The respondents received information about the benefits of the syrup products from jackfruit cobs, they would definitely buy jackfruit syrup, accounting for 85.00 percent, with the most buying reason due to novelty, accounting for 29.00 percent, and the cost of producing 1 liter of jackfruit cob syrup was 170.17 baht.

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