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DEVELOPING OF READY TO DRINK BASED ON ROSELLA FLOWER (HIBISCUS SABDARIFFA L.), STEVIA LEAF (STEVIA REBAUDIANA BERTONI), AND CHIA SEED (SALVIA HISPANICA L.)

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Abstract: Rosella flower potencially develop to be ready to drink product. Another ingredients such as stevia leaf and chia seed is needed to improve taste and funcional value. This research use mixture design as method and supported to get the best optimum of formulation by Design Expert 7 program. This results was analyzed using ANOVA and the optimum formula determine by desirability value. The quality of ready to drink is determined by physical test (the color), Chemical test (ash, pH, total dissolved solids and antioxidant activity), and organoleptic test (color, aroma, taste and reference). The results showed that the optimum formula is obtained by composing 1.60% of rosella flower, 1.04% of stevia leaf, and 0.35% of chia seeds. The formulation has the characteristics of red browny colour (score 3.77), a little bit of langu (score 3.69), a little bit of acid (score 3.77), 27.03 ^{h}ue (red) color test, 7.34% of ash, 4.53 brix of total dissolved solids, 3.22 of pH 29.37 µg/ml (IC_{50}) of antioxidant activity.

Keywords: ready to drink, rosella flower, stevia leaf, chia seed, and mixture design.

I. Introduction

The development of drink products, gives many options for consumers to choose products they want to consume. The sour taste of rosella flowers makes the manufacturer add sweeteners or other ingredients so that the sour taste can be reduced (Mukharomah et al., 2010). One source of sweeteners that can be used is stevia leaves that have health effects.

Stevia leaves have a sweetness level 200-300 times sweeter than sugar cane. Stevia leaves can provide options for certain consumers who cannot or should not consume granulated sugar or sugar cane for example diabetics and consumers who are on a diet program. In addition, stevia sugar is safer than synthetic or artificial sweeteners (Ratnani and Anggraeni, 2005).

In addition, people began add chia seed to drinks or foods. Chia seed contain omega 3 fatty acids, dietary fiber, protein and antioxidants and can lower and maintain blood cholesterol levels. Chia seed has an effect on weight loss in obese people (Safari et al, 2016). The contain makes chia seed developed as a ready to drink beverage product.

This research aims to obtain the best quality ready to drink beverage product formulations based on rosella, stevia leaves, and chia seeds. Then this ready to drink a beverage that can be called by the name of Rosviachi drink.

II. Materials and methods

2.1 Matherials

The materials used in making ready to drink are rosella flowers, stevia leaves, chia seeds, water and bottled. Moreover for the tools used in the manufacture of ready to drink beverage are stoves, pans, bowls, glasses, measuring cups, spoons, filters, scales.

2.2 Methods

The process of making ready to drink beverage refers to the research of Purwadi et al. (2010). The manufacture of ready to drink beverage begins with the preparation of raw materials including sorting which aims to select good, intact, non-defective form materials. Washing of materials that aims to clean and remove rosella flowers from dirt or foreign objects that stick, by putting the rosella flowers into a container then flowing with running water. Mixing rosella flowers and stevia leaves in containers according to a predetermined formulation. After the further mixing process, each formulation is added with 300 ml of hot water 100^{O}C then stirred and left to stand until it turns reddish color. After the

mixing process, until it changes color it is filtered using a filter to separate the rosella flowers and stevia leaves from the extract. Furthermore, the rosella flower and stevia leaf extract in each formulation is added with chia seeds according to the predetermined formula. In this process, the ready to drink beverage is packed into bottles with 300 ml packages.

Determination of the number of combinations of free variable formulations using the Design Expert 7® application, which is a software that provides experimental designs to optimize product and process designs. In this research, Design Expert 7® software is used as the main tool to obtain the optimal combination of the relative proportions of rosella flowers, stevia leaves, chia seeds with the mixture design.

The first phase of data analysis in the Design Expert 7® program is the response analysis. And then, each response variable is analyzed by means of analysis of variance (ANOVA). The ANOVA model used can be selected according to what the program suggests, namely the model that has the highest level and produces a significant ANOVA value. The ANOVA models contained in this program are Linear, Quadratic, Special Cubic, and Cubic. The model that gives significance to ANOVA and non significance to the lack of fit is chosen to analyze the response variable. In addition, there is also a normal residual plot which indicates whether the residuals (the difference between the actual response and the predicted response) follow a normal line (straight line). The data points that are getting closer to the normal line indicate that the data is spread normally, which means that the actual results will be close to the results predicted by the Design Expert 7® program. The combination between the components that affect the response value will be shown in the contour plot graph. The different colors on the contour plot graph show the response value, blue for the lowest value and red for the highest value. The lines consisting of dots on this graph show a combination of the three components with different numbers that produce the same response (Nurmiah, 2013).

In the Design Expert, there is an analysis of variance (ANOVA) and a graph of normality, after which the optimization stage is carried out which can provide the best formula solution of several suggested formulas with the closest desirability value which will then be recommended by the Design Expert program. As the optimum formula solution, so for the next step the formula solution will be used.

After designing the formula, then determining the response. The responses used in this research is the color, ash content, pH, total dissolved solids, antioxidant activity, and for hedonic and hedonic quality is of color, aroma, taste and preferences.

The results of measurement and calculation of each responses are used data input in the Design Expert 7® application. All formulas subjected to physical, chemical, and organoleptic quality testing. Physical quality test is the color test. Chemical quality test is ash content, pH, total dissolved solids, antioxidant activity. Organoleptic tests were conducted by 25 semi-trained panelists, namely the level of preference test (hedonic test), and the hedonic quality test which included parameters of color, aroma and taste. In the hedonic test, panelists were asked for personal responses about preferences for aroma, color and taste parameters with the following assessment criteria: (1) really dislike, (2) dislike, (3) a little bit of like, (4) like, and (5) really like.

While in the hedonic quality test, impression of hedonic quality is more specific that is it not just like it or not but is more specific than the specific properties of a particular product. The parameters tested included color (brownish red, red tended to brown, red browny, red, and pink), aroma (very langu, langu, a little bit of langu, not langu, and not very langu), and taste (very acid, acid, a little bit of acid, not acid, and not very acid).

III. Results and discussion/Results

3.1 Physical quality

3.1.1 The color test

The physical quality of ready to drink based on rosella flowers, stevia leaves and chia seeds was tested by measuring the color of the drinks using the minolta chromameter method. Measuring color is by adding 300 ml of water for every 3 grams of ready to drink powder. From this infusion then use a measurement tool in the form of a minolta chromameter which will get the color after being dispersed or reflected by light.

Color information or °Hue on ready to drink of rosella flowers, stevia leaves and chia seeds is generated from the calculation of the values of L, *a*, and *b*. The highest results obtained from the color measurement in Table 2 were the A3 formula, namely 33.79 with 1.103% rosella flower formulation, 1.200% stevia leaves, and 0.697% chia seeds. The lowest value is in formula A15, namely 24.96 with rosella flower formulation of 1.486%, stevia leaves 1.200% and chia seeds 0.314%. This range of values indicates that this drink is susceptible to red color. This is due to the presence of a mixture of ingredients in the formulation in the brewing process.

The results of analysis of variance (ANOVA) carried out by the Design Expert 7® program show that the recommended model has a p value of "Prob> F" less than 0.05, namely 0.0084. This means that the 16 formulations tested had a significant effect on the color of ready to drink drinks. The average value of the color test is 28.85 with a standard deviation of 1.14. The value predicted and the actual value by the mixture design for the color test were 0.2591 and 0.6717. The resulting predictive value supports the actual value because the difference between the two is less than 0.2. The precision value for the color test is greater than 4, namely 8,822. The water test graph is depicted in the form of a countour plot in Picture 1.

The Countour Plot graph in Picture 1 illustrates how the combination of material proportions affects each other's test values. The colors on the chart represent the color values. The lines consisting of dots on the graph show the combination of the three components with different amounts producing different responses.

3.2 Chemical quality

3.2.1 Ash content

Based on the ash content test shown in Table 3, the percentage of ash content in ready to drink made is around 6.5% to 8.1%. The lowest ash content analysis value with a score of 6.5% is indicated by the formula A14, A14, and A15, while the highest value with a score of 8.1% is shown by the A12 formula. According to SNI 01-3143-2011, the ash content requirement in packaged tea drinks is a maximum of 8%. Of the 16 formulas tested, the ash content of each formula was one formula that did not meet these requirements.

The results of analysis of variance (ANOVA) carried out by the Design Expert 7® program show that the recommended model has a p value of "Prob> F" less than 0.05, namely 0.0309. This means that the 16 formulations tested had a significant effect on the ash content test. The average value of the ash content test is 7.18 with a standard deviation of 0.38. The value predicted and the actual value by the mixture design for the ash content test were 0.0780 and 0.3243. The resulting predictive value supports the actual value because the difference between the two is less than 0.2. The precision value for the ash content test is greater than 4, that is 5,868.

The contour plot graph in Picture 2 illustrates how the combination of material proportions affects each other's ash content. The color on the graph shows the value of the ash content. The lines consisting of dots on the graph show the combination of the three components with different amounts producing different responses.

According to Roni (2008), the higher the value of the ash content, the more inorganic content is in the product. The components of inorganic materials in a material vary greatly in both type and quantity.

3.2.2 pH

Based on the pH value test on ready to drink based on rosella flowers, stevia leaves and chia seeds found in Tabel 4, ranged from 3.14 to 3.67. The highest pH value in formula A14 is 3.67 with rosella flower formulation of 1.800%, stevia leaves 0.900% and chia seeds 0.300% while the lowest level in formula A2 is 3.14 with rosella flower formulation 1.486%, stevia leaves 1.200% and chia seeds 0.314%.

The results of analysis of variance (ANOVA) conducted by the Design Expert 7® program show that the recommended model has a p value of "Prob> F" less than 0.05, which is <0.0001. This means that the 16 formulations tested had a significant effect on the pH value. The average value of the pH value test is 3.37 with a standard deviation of 3.17. The predicted value and the actual value by the mixture design for the pH value test were 0.9370 and 0.9781. The resulting predictive value supports the actual value because the difference between the two is less than 0.2. The precision value for the pH value test is greater than 4, that is 28,339.

The contour plot graph in Picture 3 illustrates how the combination of material proportions affects each other's pH values. The colors on the chart represent the color values. The lines consisting of dots on the graph show the combination of the three components with different amounts producing different responses.

3.2.3 Total dissolved solid

Based on the test, the total value of dissolved solids in ready to drink based on rosella flowers, stevia leaves and chia seeds in Table 5 ranges from 4.35 brix - 4.65 brix. The highest total value of dissolved solids in formula A13 was 4.65 with rosella flower formulation of 1.098%, stevia leaf 1.002% and chia seed 0.900% while the lowest level was formula A15 which 4.35 with rosella flower formulation 1.486%, stevia leaf 1,200% and chia seed 0,314%.

The results of analysis of variance (ANOVA) carried out by the Design Expert 7 program show that the recommended model has a p value of "Prob> F" greater than 0.05, namely 0.1576. This means that the 16 formulations tested had no significant effect on the total dissolved solids. The mean value of the total dissolved solids test was 4.55 with a standard deviation of 0.069. The predicted value and the actual value by the mixture design for the ash content test were -8.5530 and 0.4440. The resulting predictive value does not support the actual value because the difference between the two is greater than 0.2. The precision value for the total dissolved solids test was greater than 4, that is 6,014.

The Countour Plot graph in Figure 4 illustrates how the combination of material proportions does not affect the total dissolved solids of each other. The color on the chart shows the total dissolved solids value. The lines of dots on the graph show the combination of the three components with different quantities producing the same response.

3.3 Formula Optimization with Design Expert Program 7®

The responses that have been analyzed will then enter the optimization stage in the Design Expert 7® program. Optimization is carried out to obtain a formula that has the right proportion of components so that the desired product is obtained and has an optimal response (Mulyawanti, 2016).

The most optimal formula is the formula with the maximum desirability value. The desirability value that is getting closer to the value of 1.0 indicates the program's ability to produce the desired product is more perfect (Nurmiah, 2013). The criteria for optimizing the ready to drink beverage formula are shown in Table 13.

In the optimization stage, goals are set to find the criteria for the response value to be achieved or desired. For antioxidant activity, goal minimized was chosen, because the smaller the IC_{50} value indicated the higher the antioxidant activity. In response to color hedonic, taste hedonic and aroma hedonic, goal maximize was chosen because the desired value of these values was the highest preference value.

As for the color hedonic quality response, goal maximized was chosen because the desired value was the highest value in the parameter, namely red-brown in color so that the results of the criteria for red tended to be brown - red slightly brown. In response to the hedonic quality of aroma, goal maximized was chosen because the desired value was the highest value in the parameter, namely very unpleasant aroma, so that the results of the criteria were unpleasant to slightly

unpleasant. In response to the hedonic quality of taste, goal maximized was chosen because the desired value was the highest value in the parameter, namely very sour taste, so that the criteria for a slightly sour taste were obtained.

By entering the desired formula criteria in the optimization, the Design Expert 7® program will provide formula solutions. The formula solution produced in the optimization stage can be seen in Table 14.

The formula solution chosen was the optimum formula with 1.604% rosella flower components, 1.043% stevia leaves, and 0.352% chia seeds. Thus the optimum formula is a formula solution provided by the Design Expert 7® program with a desirability value of 0.617. This means that the formula will produce a product with the characteristics according to the optimization target of 61.7%.

IV. Conclusion

The results of the quality analysis of ready-to-drink drinks with test parameters for color, ash content, pH value, taste hedonic, color hedonic quality and aroma hedonic quality have significant results in the analysis of variance (ANOVA).

The results of the quality analysis of ready to drink with parameters of total dissolved solids, antioxidant activity, hedonic color test, and taste hedonic quality test had no significant results in the analysis of variance (ANOVA).

The optimum formula for ready-to-drink drinks chosen by the Design Expert 7® program with the formulation of 1,604% rosella flower components, 1,043% stevia leaves, and 0.352% chia seeds. The optimum formula has an organoleptic score for the hedonic test on color parameters of 3.84 (a little bit of like), aroma of 3.85 (a little bit of like), and taste of 3.64 (a little bit of like). For the organoleptic score of the hedonic quality test, the color parameter was 3.77 (red browny), the aroma parameter was 3.69 (a little bit of langu), and the taste parameter was 3.77 (a little bit of acid). The results of the analysis of the quality of physical analysis have a color test of 27.03 oHue. The chemical quality analysis results show that formula 1 has an ash content of 7.34%, total dissolved solids 4.53 brix, a pH value of 3.22, antioxidant activity of 29.37 µg / mL (IC_{50}).

Conflict of interest

The authors declare no conflict of interest.

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Tables and Figures

Tables

Table 1. Design Formulation Of The Design Expert 7® Program.

Formulas	Formulations (%)		
	Rosella Flowers	Stevia Leaf	Chia Seed
A1	1.494	1.060	0.446
A2	1.800	0.900	0.300
A3	1.103	1.200	0.697
A4	0.902	1.200	0.898
A5	1.637	1.044	0.319
A6	1.334	0.900	0.766
A7	1.486	1.200	0.314
A8	1.354	1.071	0.575
A9	1.334	0.900	0.766
A10	1.098	1.002	0.900
A11	1.216	1.048	0.736
A12	1.800	0.900	0.300
A13	1.098	1.002	0.900
A14	0.902	1.200	0.898
A15	1.486	1.200	0.314
A16	1.589	0.902	0.509

Table 2. Color Test Values For Ready To Drink.

Formulas	The Results			
	L	*a*	*b*	°*Hue*
A1	29,71	7,89	4,43	29,34
A2	28,48	8,44	4,80	29,65
A3	28,73	7,75	5,18	33,79
A4	29,82	7,11	3,77	27,94
A5	29,12	8,19	4,16	26,92
A6	29,55	8,26	4,53	28,74
A7	29,73	7,61	3,92	27,26
A8	28,78	8,09	4,54	29,32
A9	29,12	7,76	4,14	28,07
A10	29,05	7,20	4,09	29,58
A11	29,89	8,32	4,99	30,99
A12	29,77	8,60	4,49	27,57
A13	28,91	7,04	3,99	29,54
A14	29,77	6,77	3,53	27,55
A15	28,91	7,22	3,36	24,96
A16	28,39	7,94	4,66	30,41

Notes :

L = Brightness

a = Red / green color

b = Yellow / blue color

Table 3. Results Of Ash Content In Ready To Drink.

Formulas	Ash Content (%)
A1	7,2
A2	7,2
A3	6,7
A4	6,5
A5	7,5
A6	6,8
A7	7,3
A8	7,3
A9	7,3
A10	7,6
A11	7,6
A12	8,1
A13	6,8
A14	6,5
A15	6,5
A16	7,2

Table 4.PH Value In Ready To Drink.

Formulas	pH Value
A1	3,30
A2	3,14
A3	3,50
A4	3,66
A5	3,21
A6	3,32
A7	3,27
A8	3,32
A9	3,37
A10	3,44
A11	3,39
A12	3,19
A13	3,47
A14	3,67
A15	3,35
A16	3,23

Table 5. Total Value Of Dissolved Solids In Ready To Drink.

Formulas	Total Value Of Dissolved Solids (Brix)
A1	4,53
A2	4,56
A3	4,59
A4	4,60
A5	4,57
A6	4,58
A7	4,57
A8	4,57
A9	4,57
A10	4,60
A11	4,56
A12	4,58
A13	4,65
A14	4,53
A15	4,35
A16	4,30

Table 6. The Value Data Of Antioxidant Activity In Ready To Drink.

Formulas	IC_{50} (ppm)
A1	25.78
A2	38.45
A3	14.72
A4	17.95
A5	25.57
A6	28.10
A7	16.62
A8	14.97
A9	19.31
A10	26.87
A11	43.73
A12	63.81
A13	48.60
A14	28.31
A15	32.29
A16	63.66

Table 7. The average Value Of The Color Hedonic Test Results Of Ready To Drink.

Formulas	Average	Information
A1	4.00	Like
A2	3.80	A little bit of like
A3	4.28	A little bit of like
A4	3.52	A little bit of like
A5	3.64	A little bit of like
A6	3.48	A little bit of like
A7	3.60	A little bit of like
A8	3.56	A little bit of like
A9	3.36	A little bit of like
A10	3.56	A little bit of like
A11	3.60	A little bit of like
A12	3.64	A little bit of like
A13	3.88	A little bit of like
A14	3.80	A little bit of like
A15	3.76	A little bit of like
A16	3.64	A little bit of like

Notes :

1 = Really dislike

2 = Dislike

3 = A little bit of like

4 = Llike

5 = Really like

Table 8.The Average Value Of The Hedonic Test Results For The Aroma Of Ready To Drink.

Formulas	Average Aroma	Information
A1	4.00	Like
A2	3.96	A little bit of like
A3	3.24	A little bit of like
A4	3.32	A little bit of like
A5	4.04	Like
A6	3.80	A little bit of like
A7	3.72	A little bit of like
A8	3.76	A little bit of like
A9	3.68	A little bit of like
A10	3.52	A little bit of like
A11	3.36	A little bit of like
A12	3.72	A little bit of like
A13	3.84	A little bit of like
A14	3.56	A little bit of like
A15	3.92	A little bit of like
A16	3.88	A little bit of like

Notes :

1 = Really dislike, 2 = Dislike

3 = A little bit of like, 4 = Like

5 = Really like

Table 9. The Average Value Of The Taste Hedonic Test Results.

Formulas	Average Taste	Information
A1	3.52	A little bit of like
A2	3.92	A little bit of like
A3	3.20	A little bit of like
A4	3.36	A little bit of like
A5	3.64	A little bit of like
A6	3.24	A little bit of like
A7	3.44	A little bit of like
A8	3.32	A little bit of like
A9	3.48	A little bit of like
A10	3.36	A little bit of like
A11	3.40	A little bit of like
A12	3.88	A little bit of like
A13	3.36	A little bit of like
A14	3.16	A little bit of like
A15	3.52	A little bit of like
A16	3.92	A little bit of like

Notes :

1 = Really dislike

2 = Dislike

3 = A little bit of like

4 = Like

5 = Really like

Table 10. The Average Value Of The Color Hedonic Quality Test Results.

Formulas	Hedonic Average Color	Information
A1	3.64	Red browny
A2	3.96	Red browny
A3	3.08	Red browny
A4	3.12	Red browny
A5	3.84	Red browny
A6	3.48	Red browny
A7	3.52	Red browny
A8	3.40	Red browny
A9	3.64	Red browny
A10	3.52	Red browny
A11	3.36	Red browny
A12	3.92	Red browny
A13	3.16	Red browny
A14	3.08	Red browny
A15	3.92	Red browny
A16	3.84	Red browny

Notes :

1 = Pink, 2 = Red

3 = Red browny

4 = Red tended to brown

5 = Brownish red

Table 11. The Average Value Of The Hedonic Aroma Quality Test Results.

Formulas	Hedonic Average Aroma	Information
A1	4.12	Langu
A2	3.52	A little bit of langu
A3	3.36	A little bit of langu
A4	3.32	A little bit of langu
A5	3.60	A little bit of langu
A6	3.52	A little bit of langu
A7	3.56	A little bit of langu
A8	3.48	A little bit of langu
A9	3.56	A little bit of langu
A10	3.40	A little bit of langu
A11	3.48	A little bit of langu
A12	3.56	A little bit of langu
A13	3.28	A little bit of langu
A14	3.44	A little bit of langu
A15	4.08	Langu
A16	3.60	A little bit of langu

Notes :
1 = Not very langu
2 = Not langu
3 = A little bit of langu
4 = Langu
5 = Very langu

Table 12. The Average Value Of The Taste Hedonic Quality Test.

Formulas	Hedonic Average Taste	Information
A1	4.32	Acid
A2	3.84	A little bit of acid
A3	3.48	A little bit of acid
A4	3.52	A little bit of acid
A5	3.32	A little bit of acid
A6	3.84	A little bit of acid
A7	3.44	A little bit of acid
A8	3.56	A little bit of acid
A9	3.64	A little bit of acid
A10	3.88	A little bit of acid
A11	3.60	A little bit of acid
A12	4.00	Acid
A13	3.40	A little bit of acid
A14	3.52	A little bit of acid
A15	3.92	A little bit of acid
A16	3.96	A little bit of acid

Notes :
1 = Not very acid,
2 = Not acid,
3 = A little bit of acid,
4 = Acid,
5 = Very acid.

Table 13. Criteria For Optimization Of Ready To Drink Beverage Formulas.

Components And Response	Criteria			
	Goal	Upper Limit	Lower Limit	*Importance*
Components				
Rosella Flowers (%)	*In range*	1.800	0.902	+ + + +
Stevia Leaf (%)	*In range*	1.200	0.900	+ + + +
Chia Seed (%)	*In range*	0.300	0.900	+ + + +
Response				
Color	*In range*	24.96	33.79	+ + + +
Ash Content	*In range*	6.56	8.18	+ + + +
Ph Value	*In range*	3.145	3.675	+ + + +
Total Dissolved Solids	*In range*	4.3	4.65	+ + + +
Antioxidant Activity	*Minimize*	14.7211	63.8138	+ + + +
Hedonic Color	*Maximize*	4.28	3.36	+ + + +
Hedonic Aroma	*Maximize*	4.04	3.24	+ + + +
Hedonic Taste	*Maximize*	3.92	3.16	+ + + +
Hedonic Quality Of Color	*Maximize*	3.96	3.08	+ + + +
Hedonic Quality Of Aroma	*Maximize*	3.28	4.12	+ + + +
Hedonic Quality Of Taste	*Maximize*	3.32	4.32	+ + + +

Table 14. Solution Formulas From The Design Expert 7® Program.

Formulation (%)			*Desirability*
Rosella Flower	Stevia Leaf	Chia Seed	
1.604	1.043	0.352	0.617

Figure

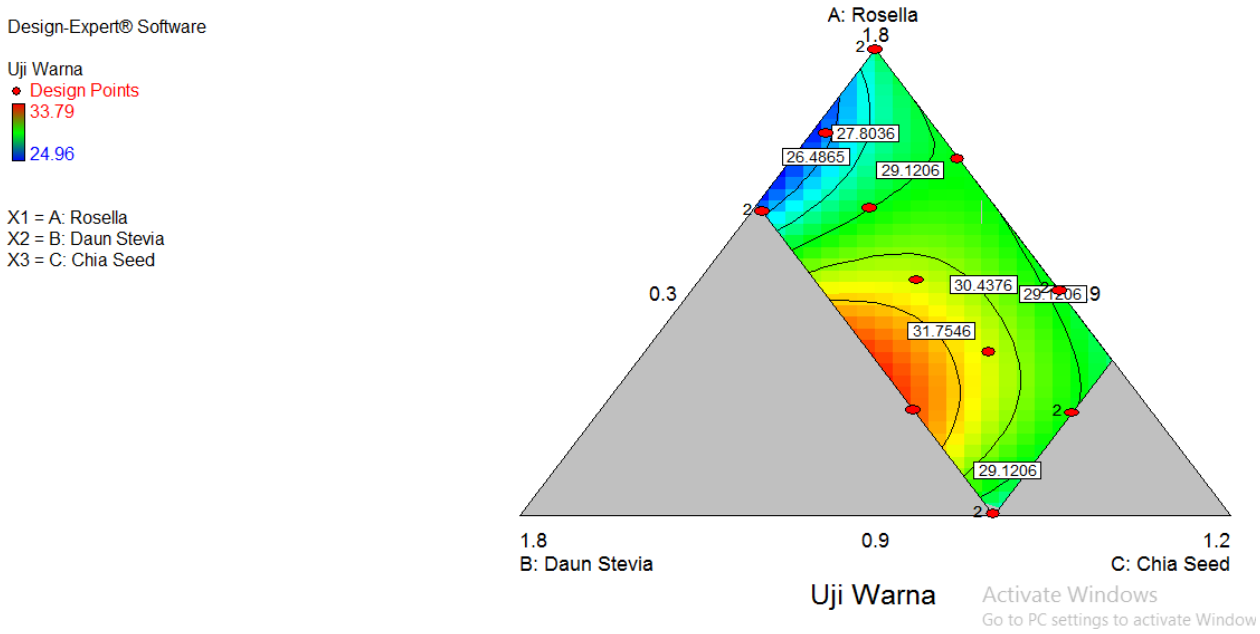

Figure 1. Contour Plot Chart Color Test.

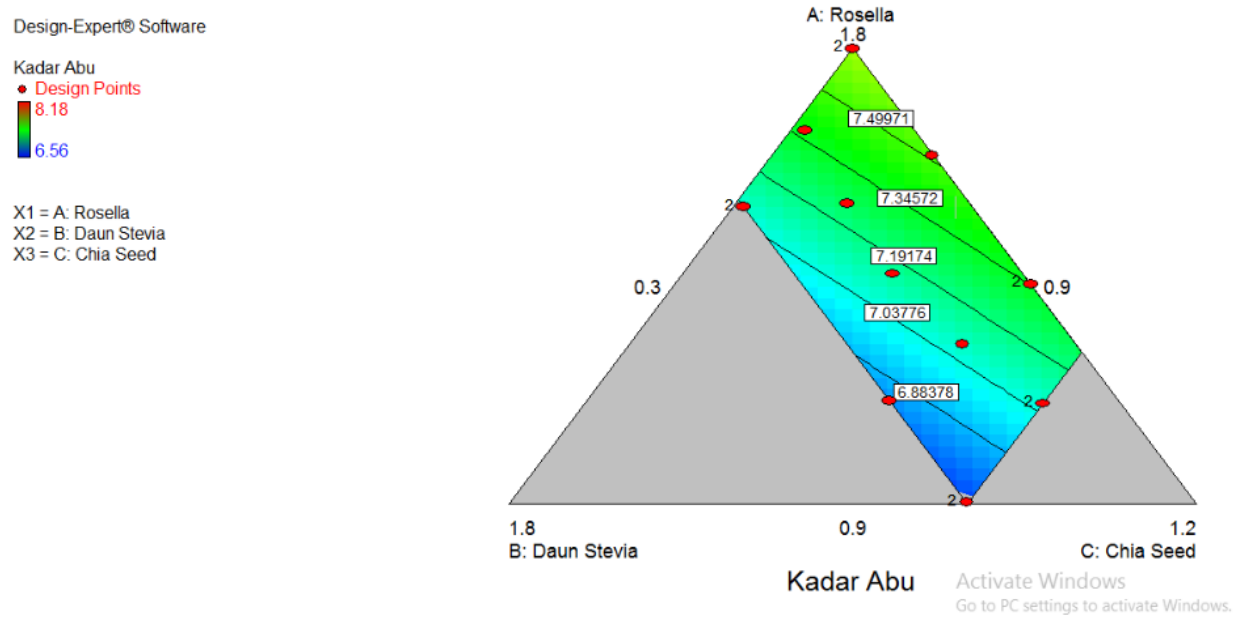

Figure 2. Contour Plot Chart Ash Content.

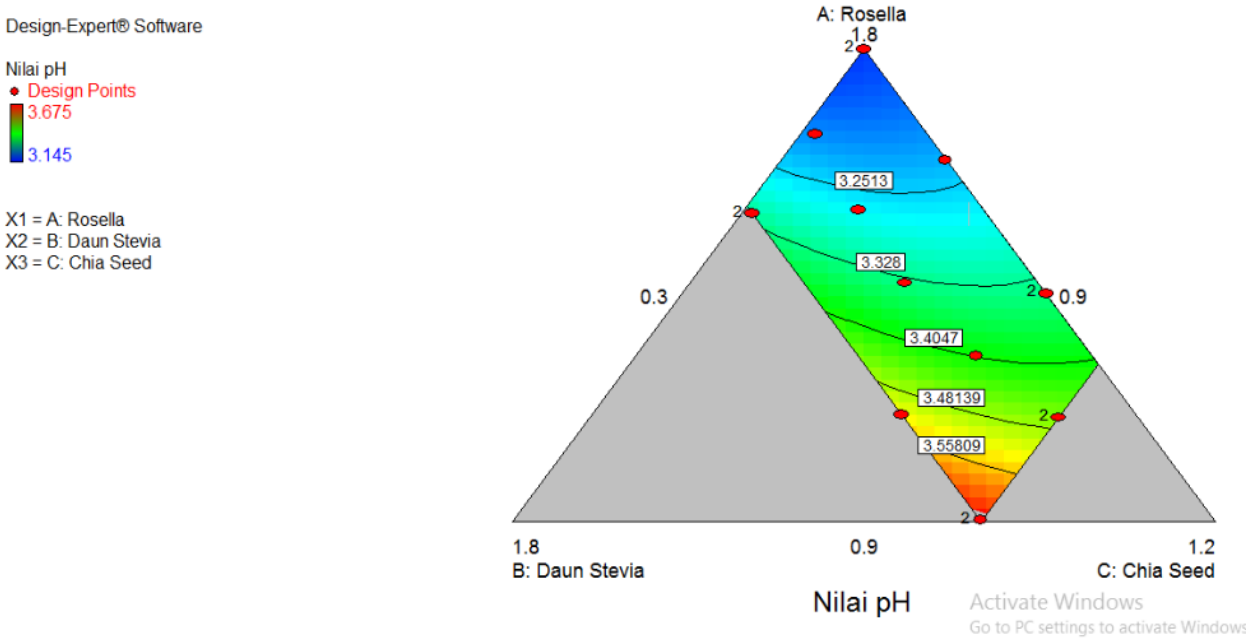

Figure 3. Contour Plot Chart Ph Value.

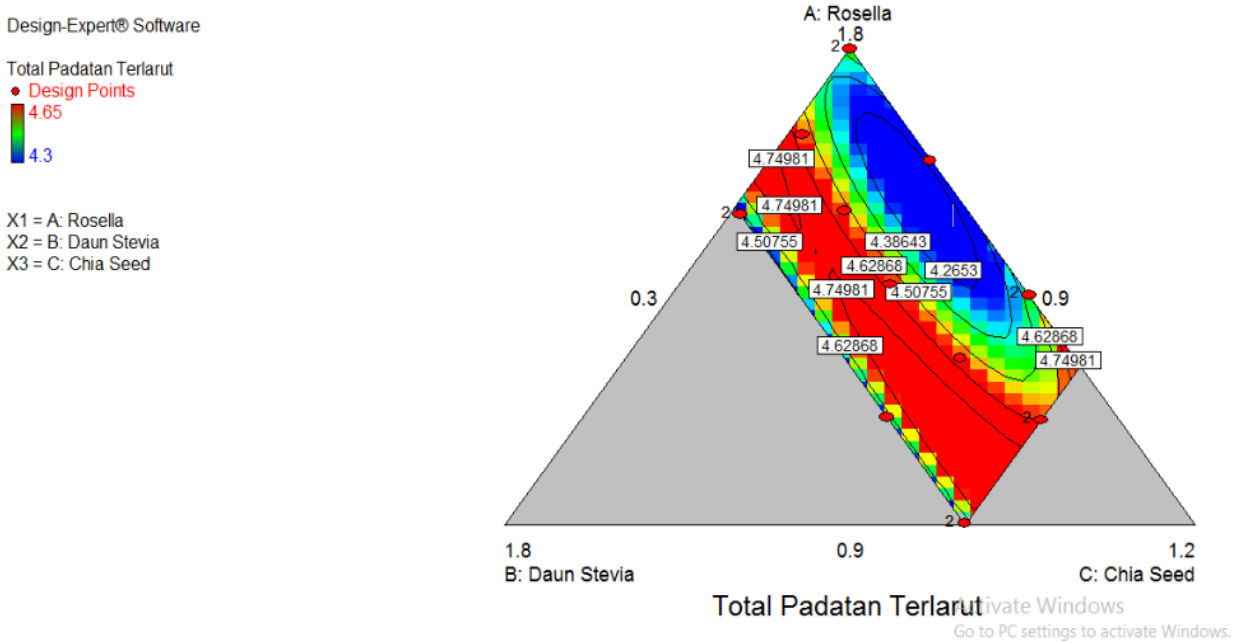

Figure 4. Contour Plot Chart Total Dissolved Solids.

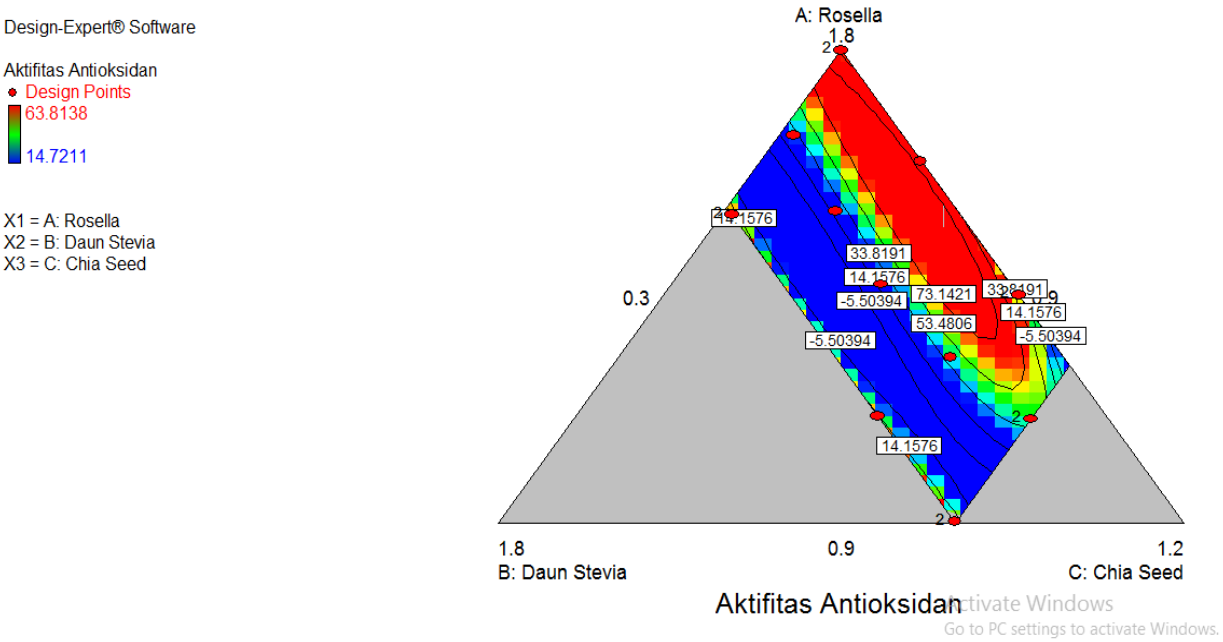

Figure 5. Contour Plot Chart Antioxidant Activity.

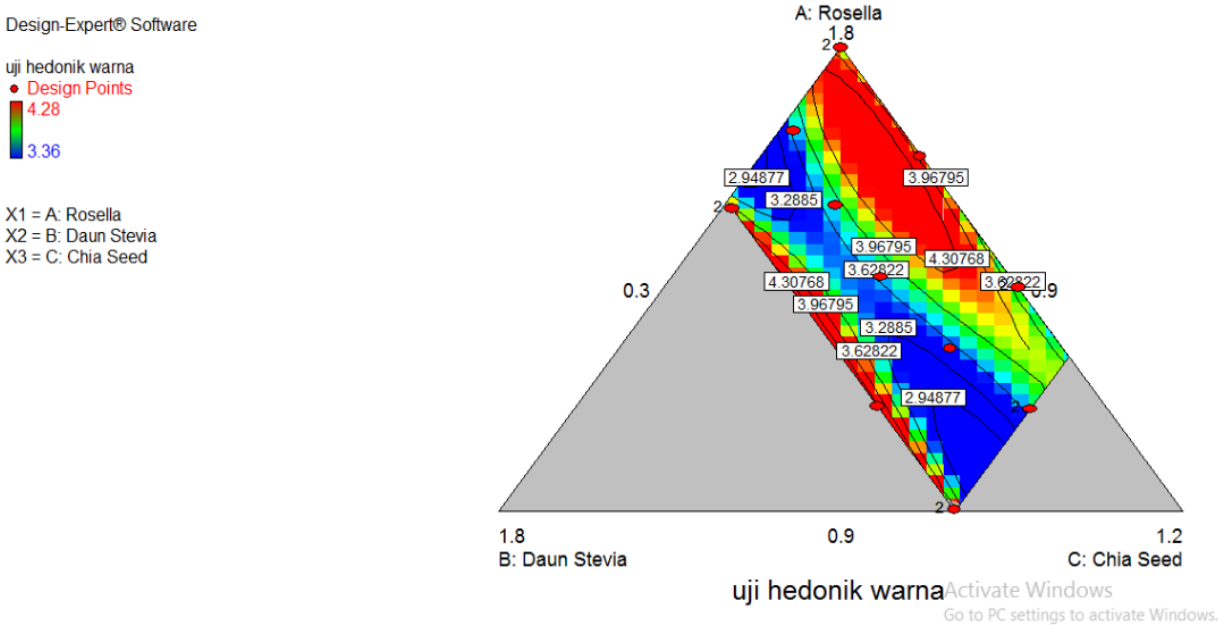

Figure 6. Contour Plot Chart Color Hedonic Test.

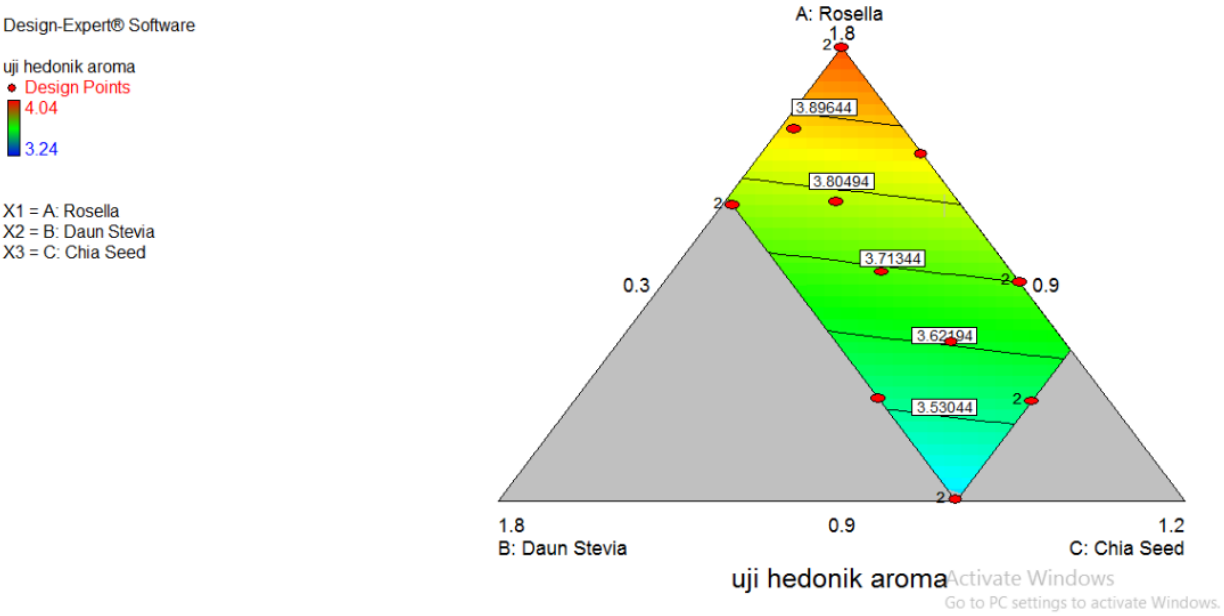

Figure 7. Contour Plot Chart Aroma Hedonic Test.

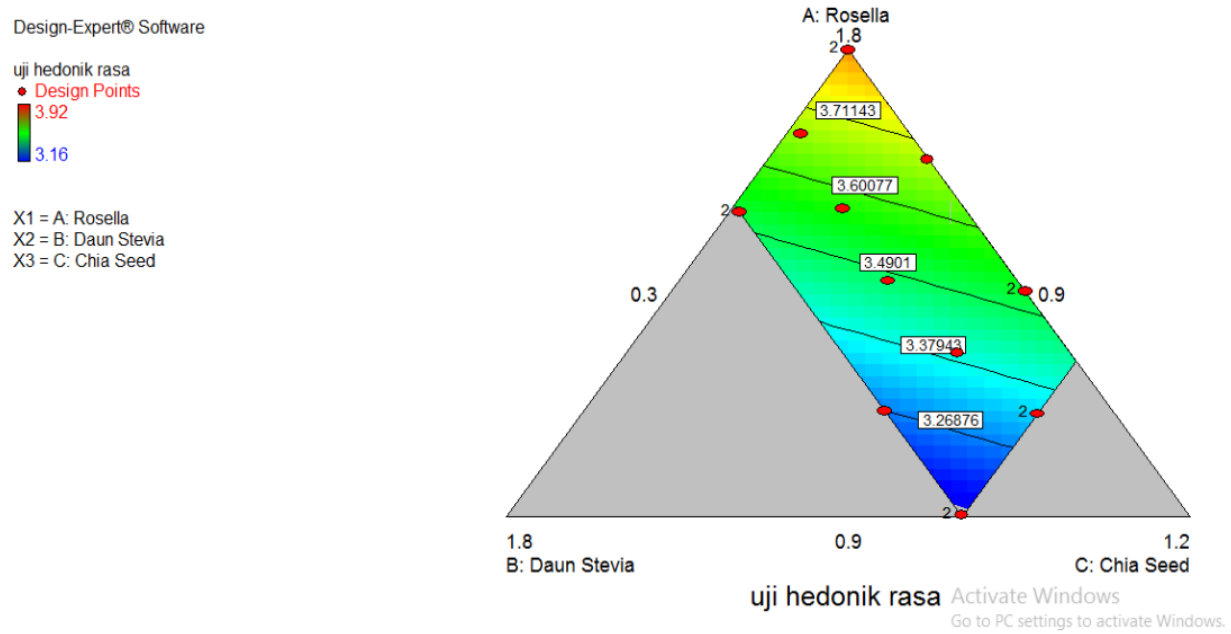

Figure 8. Contour Plot Chart Taste Hedonic Test.

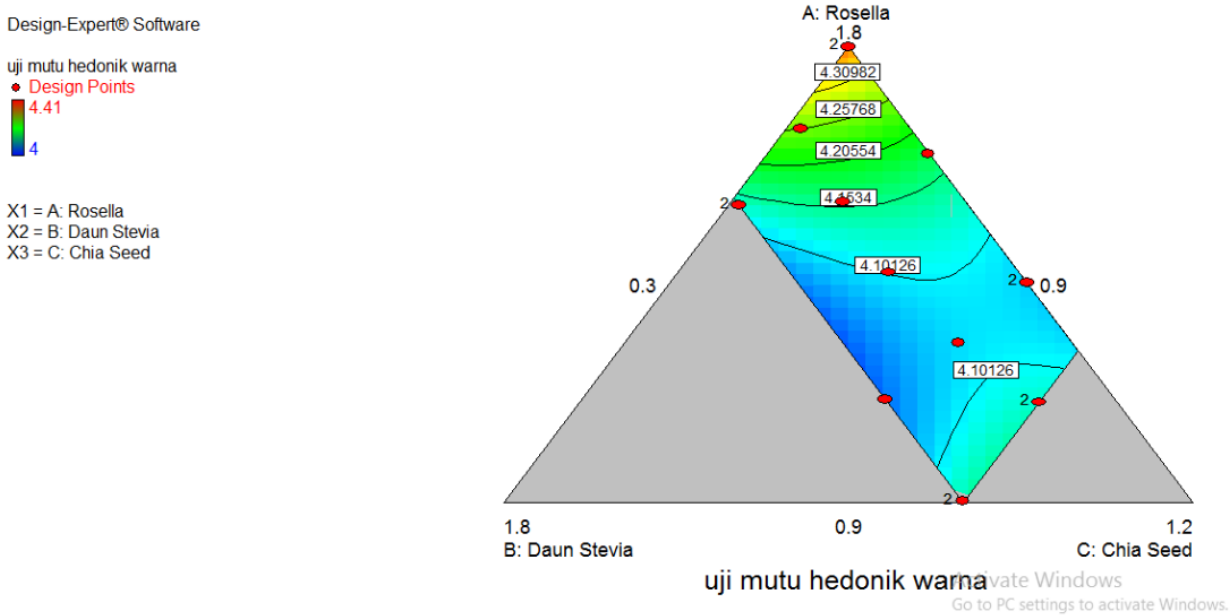

Figure 9. Contour Plot Chart Color Hedonic Quality Test.

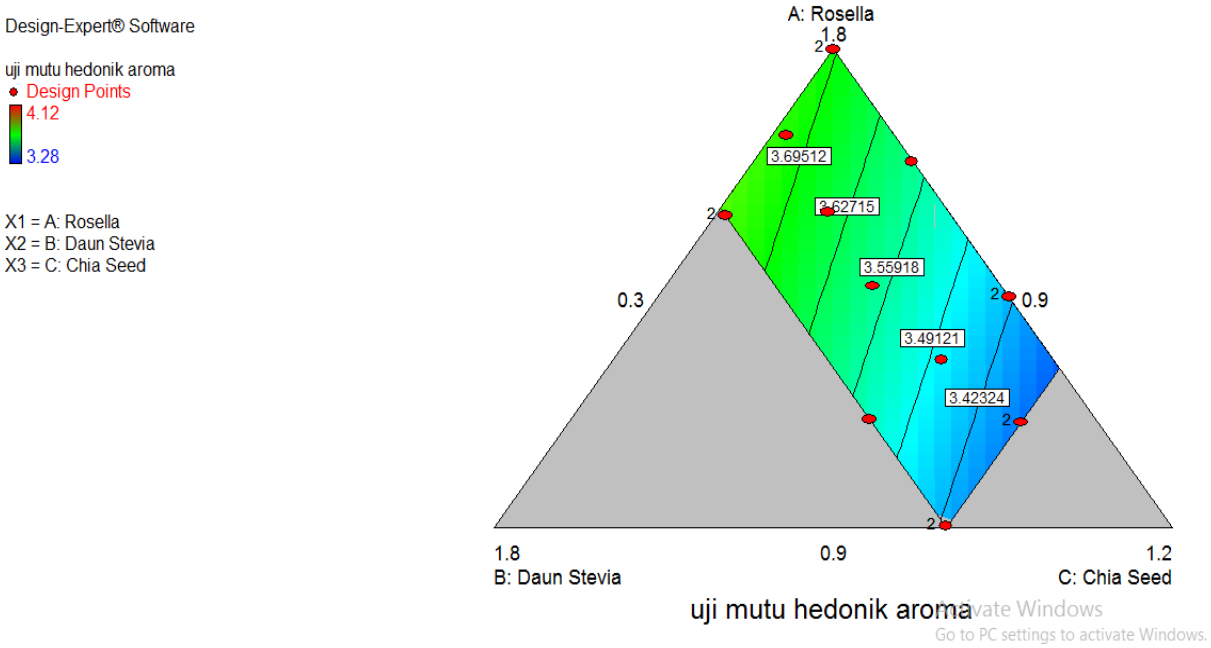

Figure 10. Contour Plot Chart Aroma Hedonic Quality Test.

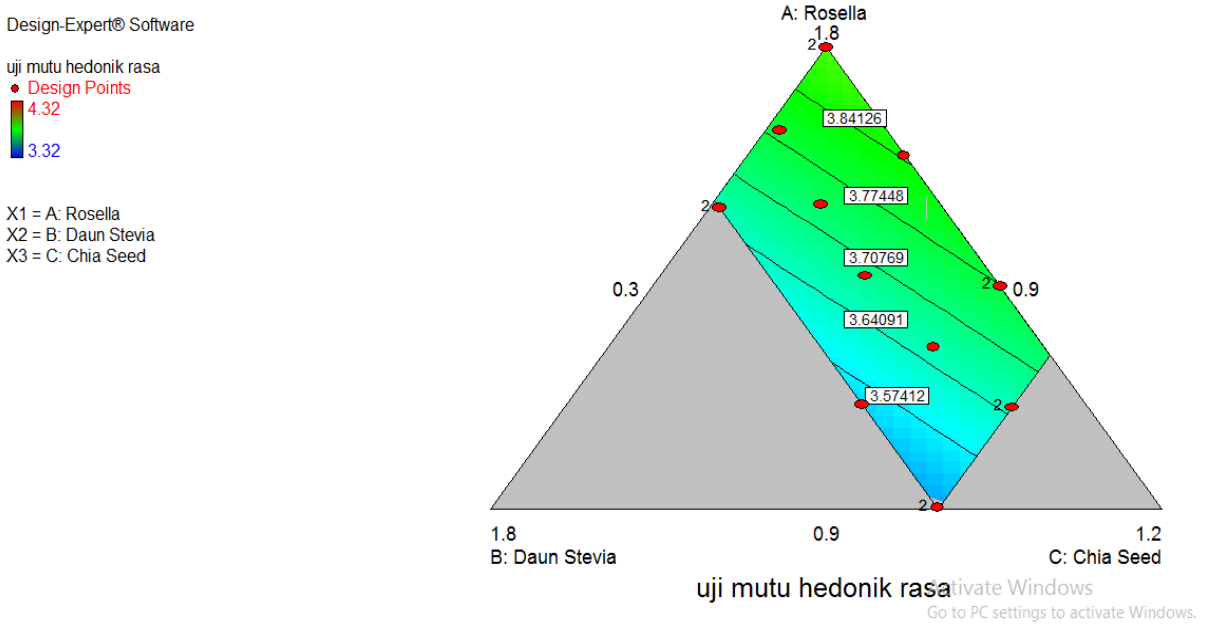

Figure 11. Contour Plot Chart Taste Hedonic Quality T