Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

Aromatherapy Candle Formulation Using Grapefruit Essential Oil with Patchouli Essential Oil Fixative

Ilham Ahmad[1*], Nur Asisah Ayu Lestari[2], Gusni Sushanti[3], Imran Muhtar[4]
State Agricultural Polytechnic of Pangkajene Islands, Pangkep, Indonesia

email: muhammadilhamahmad02@gmail.com

Received: 2023-06-24
Accepted: 2023-06-24
Publication: 2023-06-25

Abstract
The aim of this study was to obtain the best color formulation of aromatherapy candles using grapefruit oil with patchouli essential oil fixative and to analyze the business feasibility of grapefruit aromatherapy candles. This research was conducted from June to August 2021 in the quality testing laboratory for the Agroindustry study program, Pangkep State Agricultural Polytechnic. This research was conducted using an experimental method with two stages, namely; first, making aromatherapy candles which aims to get the best color concentration in aromatherapy candles with a hedonic test, after the hedonic test with the best color will proceed to further research, namely the stage of selecting the aromatherapy candle aroma of grapefruit essential oil as a binder added with patchouli oil. Business continuity analysis is carried out by looking for investment costs, variable costs, profits, production Break Even Point (BEP), price Break Even Point (BEP), Benefit Cost Ratio (BCR), and pay back period. The results showed that the best color formulation of aromatherapy candles was in the A3 treatment with a color concentration of 1.5% with an average of 3.6. The best aromatherapy candle formulation was in treatment B3 with a concentration of 2.5% grapefruit oil and 0.25% patchouli oil fixative with an average hedonic test result of 4.36. The best formulation of the effect of aromatherapy candles was in treatment B3 with a concentration of 2.5% grapefruit oil and 0.25% patchouli oil fixative with an average organoleptic test result of 6.52 and 80% of the panelists felt relaxed, comfortable, fresh and somewhat refreshed. The results of the Benefit Cost Ratio (BCR) calculation analysis in the aromatherapy business with a BCR value of 1.11 indicate that this business is feasible to develop.

Keywords: Aromatherapy Candles, Feasibility Analysis, Grapefruit Essential Oil, Patchouli Essential Oil

Introduction

Aromatherapy candles are a form of diversification of candle products. Aromatherapy candles have many functions, namely as lighting tools, therapeutic media and room fresheners. Aromatherapy candles are an alternative to the application of aromatherapy by inhalation (inhalation), namely inhaling the aroma vapor produced from a few drops of essential oil in a container filled with hot water. Aromatherapy candles will produce a scent that provides a calming and relaxing therapeutic effect when burned (Primadiati, 2002).

Making aromatherapy candles requires stearin, paraffin and essential oils. Stearin is made by reacting stearic acid with glycerol. Stearin is a glyceride that has a high melting point because it contains high amounts of palmitic acid and stearic acid. Stearic acid (Stearic Acid) is also widely used to change the consistency or melting temperature of a product as a lubricant, or to prevent oxidation (Sumardjo, 2006).

The perceived benefits of using aromatherapy aside from providing a sense of calm are also other benefits because aromatherapy products contain essential oils which have health

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

benefits such as flu symptoms, nausea, dizziness and even acne. Essential oil here can help reduce the symptoms of the disease so it doesn't get worse and can reduce the use of pharmacological drugs (Louisa, et.al, 2020). One of the media often used by respondents in Utami's 2020 research is candles. Wax is used as an aromatherapy medium because it has a high melting point and easily binds aromas and releases them into the air, the combustion results are clean and do not emit toxic substances.

Grapefruit oil has a mild and fragrant smell and flavor, reminiscent of the smell of oranges and lemons, and its aroma has antidepressant properties. Patchouli oil is also very helpful in dealing with depression, anxiety and stress (Purba, 2017). Orange is a fruit commodity that has important economic value and significant health value because it contains high nutritional value (Vitamins C and A) (Sulfatriani, 2017).

Patchouli oil is also very helpful for dealing with depression, anxiety and stress. Patchouli oil can also be used as a fixative or binder for other fragrance ingredients. The role of patchouli oil as a perfume fixative cannot be replaced by any oil, so it is very important in the world of perfumery (Purba, 2017). Patchouli (pogostemo cablin Benth) is a fragrant shrub with smooth leaves and rectangular stems. The dried leaves of this plant are distilled to obtain oil (patchouli oil) which is widely used in various industrial activities. The main component contained in patchouli oil is patchouli alcohol which functions as an anti-inflammatory, anti-inflammatory, antidepressant, and decongestant. (NurAfdhalia, 2017).

Essential oils or essential oils are secondary metabolites produced by plants and are one of the commodities that have a large market demand. Essential oils are usually liquid and have a distinctive aroma according to the plant source. The use of essential oils is very broad, starting from cosmetics, perfumes, the food and beverage industry, to the pharmaceutical industry (Julianto, 2016).

Research Method

This research was conducted from June to August 2021 in the quality testing laboratory for the Agroindustry study program, Pangkep State Agricultural Polytechnic.

This research was conducted using an experimental method with two stages, namely; first, making aromatherapy candles which aims to get the best color concentration in aromatherapy candles with a hedonic test, after the hedonic test with the best color will proceed to further research, namely the stage of selecting the aromatherapy candle aroma of grapefruit essential oil as a binder added with patchouli oil.

Aromatherapy Candle Base Making Process

Ingredients in weighing paraffin wax and stearin as much as 60:40 (Siregar, 2019) glory is melted in the temperature range of 65-800C then the selection of the preferred color, the concentration of dye added to the candle is no more than 2% because it will produce a very concentrated color (Siregar, 2019) after that it is stirred and homogenized in the temperature range of 550C, namely at the temperature where stearin begins to solidify again the glory paired with a candle wick with a length of 4 meters in the middle.

Table 1 Preferred color concentration selection formulation

Base	**A1**	**A2**	**A3**
Base concentration of paraffin and stearin 60:40 (g)	0.5	1.0	1.5

Information:

A1 : 0.5% oil-based dye concentration formula
A2 : Formula Concentration of oil-based dyes 1%

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

A3 : Formula Concentration of oil-based dye 1.5%

The second stage, the selection of the preferred aroma using the best preferred candle color base from the first stage. The concentration formulation that can be received aromatherapy candles is 2-4% pure essential oil (Siregar, 2019). The wax scent used is grapefruit essential oil aroma as an aroma binder added patchouli oil 10% of each oil concentration.

Table 2 Formula for selecting preferred aromas

Material	B1	B2	B3	B4
Grapefruit Essential Oil (g)	1	1.5	2	2.5
Patchouli Oil (g)	0.1	0.15	0.2	0.25

Information:

B1 : Comparison formula of combination of 1% grapefruit oil and 0.1% patchouli oil
B2 : Comparison formula of combination of 1.5% grapefruit oil and 0.15% patchouli oil
B3 : Comparison formula of combination of 2% grapefruit oil and 0.2% patchouli oil
B4 : Comparison formula of combination of grapefruit oil 2.5% and patchouli oil 0.25%

Aromatherapy Candle Making Procedure

Weigh the required amount of paraffin wax, stearin and dye, heat it in a container, put the paraffin wax, stearin and dye into the container according to the specified concentration, then melt it at a temperature range of 65-84ºC. After that, stir and homogenize using a stir bar, wait until the temperature drops to 55ºC, at the temperature where the stearin starts to solidify again, then drop grapefruit essential and patchouli oil as a fixative according to a predetermined concentration, stir and homogenize using a stir bar. Then put it in a mold that has a candle wick with a length of 4 cm in the middle and wait for the wax to solidify into a candle.

Data Types and Sources

The data used are primary data and secondary data. Primary data was obtained from research results and secondary data was obtained from various relevant literature sourced from previous research, journals, articles, internet books and other sources.

Data analysis technique

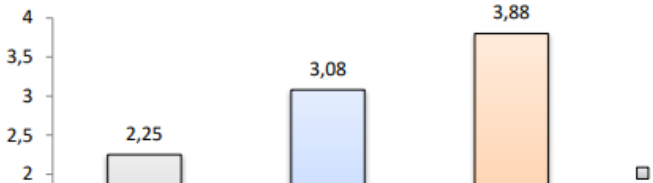
The data analysis technique in this study was to make direct observations of the sample using the technique of finding the highest average.

Business feasibility analysis

Business feasibility analysis by looking for investment costs, variable costs, profits, production Break Even Point (BEP), Price Break Even Point (BEP), Benefit Cost ratio (BCR), Playback period.

Results and Discussion

Aromatherapy Candle Color favorability test



Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

Figure 1 percentage of panelists' favorability for Aromatherapy candle colors
Information:

A1 : 0.5% oil-based concentration formula

A2 : Formula Concentration of oil-based dyes 1%

A3 : Formula Concentration of oil-based dyes 1.5% This test is carried out with the tested aspect in the form of liking for candle color.

The results of the hedonic test of wax liking on the overall appearance of candles were loaded on a scale of 1-5 with a total of 25 panelists. Based on figure 7, the highest average color favorability test result of 3.88 was in the A3 treatment with a color concentration of 1.5%, while the lowest average value of 2.25 was in the A1 treatment with a color concentration of 0.5%. This is because the color in the A3 treatment is lighter and more attractive than the A1 treatment. the concentration of dye added to wax is not more than 2% (Siregar, 2019)

Aromatherapy Candle Scent Favorability Test

Aromatherapy by inhalation (inhalation) is the inhalation of aroma vapors produced from a few drops of essential oils, one application of aromatherapy using wax media. Aromatherapy candles will produce an aroma that gives a therapeutic effect when burned. The wax aroma is produced from essential oils which are classified as a type of aroma that can provide soothing and relaxing therapeutic effects. (Vidayanti, 2019).

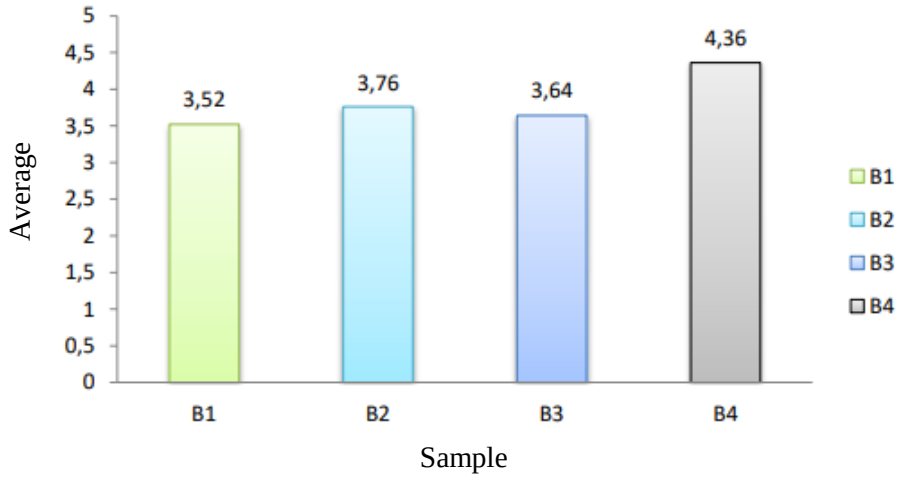


Figure 2 percentage of panelists' favorability for aromatherapy candle scents
Information:

B1 : Comparison formula of combination of 1% grapefruit oil and 0.1% patchouli oil

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

B2 : Comparison formula of combination of 1.5% grapefruit oil and 0.15% patchouli oil
B3 : Comparison formula of combination of 2% grapefruit oil and 0.2% patchouli oil
B4 : Comparison formula of combination of grapefruit oil 2.5% and patchouli oil 0.25%

This test continued from the first study with the best color concentration of 1.5% carried out with aspects tested for the level of liking for aromatherapy candle aromas. Test results are loaded on a scale of 1-5 with 25 panelists. Based on the diagram of figure 8, the average result of the highest aromatherapy candle aroma favorability test was 4.36 in the B4 treatment with a concentration of grapefruit oil 2.5%, patchouli oil fixative 0.25%, and the lowest favorability test with an average of 3.52 was in the B1 treatment with a grapefruit oil concentration of 1%, patchouli oil fixative 0.1%. This is because the concentration of essential oil concentration is lower so that the aroma that comes out is not inhaled. The concentration of oil obtained is also based on the opinion of Oppenheimer (2001), that in general or wax can only accept 2 to 4 percent pure essential oil. By making a comparison of its concentration.

Test The Effect of Aromatherapy Candles

According to (Sipahelut, 2018) Test the liking of candle aroma when burned by knowing the level of consumer preference for the aroma added to the candle. The favorability test when burned will provide more accurate assessment results. Burning wax melts the wax and evaporates the essential oil bound to stearin.

Table 3 Aromatherapy candle effect test results

No.	Effects of aromatherapy candles	B1	B2	B3	B4
1	No effect	8%	4%	12%	0%
2	Tightness	0%	0%	0%	0%
3	Dizziness	8%	8%	4%	4%
4	Slightly dizzy	0%	8%	8%	20%
5	Relax	16%	12%	16%	20%
6	Convenient	16%	8%	16%	24%
7	Fresh	24%	24%	16%	28%
8	Somewhat fresh	20%	36%	28%	8%
9	Drowsiness	0%	0%	0%	0%
10	Slightly sleepy	0%	0%	0%	0%

Based on table 4 Test results of aromatherapy candles when burned, the best treatment is B4 with a concentration of 2.5% grafruit oil, 0.25% patchouli oil, where researchers feel the effects of aromatherapy candles, all panelists do not feel the effects of drowsiness, rather drowsiness, tightness and dizziness.

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

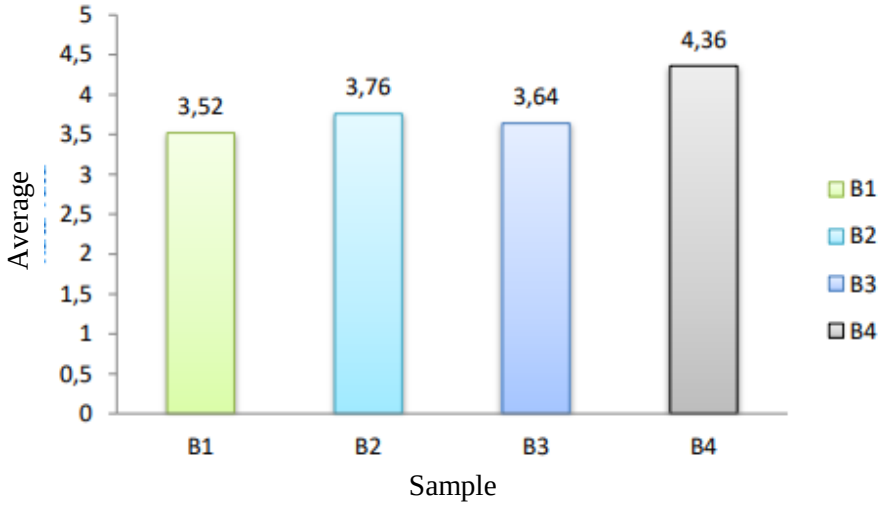


Figure 3 percentage of panelists' favorability for the effect of aromatherapy candles

Information:

B1 : Comparative formula for a combination of 1% grapefruit oil and 0.1% patchouli oil

B2 : Comparative formula for a combination of 1.5% grapefruit oil and 0.15% patchouli oil

B3 : Comparative formula for a combination of 2% grapefruit oil and 0.2% patchouli oil

B4 : Comparative formula for a combination of 2.5% grapefruit oil and 0.25% patchouli oil

This test was carried out with the aspect being tested in the form of liking for the color of the candle. The results of the hedonic test of wax preference for the appearance of wax as a whole are loaded on a scale of 1-10 with a total of 25 panelists. Based on the picture above, the highest average results of the aromatherapy candle effect test were 6.52 in treatment B4 with a concentration of 2.5% grapefruit oil and 0.25% patchouli oil fixative, while the lowest average value was 5.68 in treatment B1 and B3 with a concentration of 1% grapefruit essential oil and 0.1% patchouli oil fixative in treatments B1 and B3 2% grapefruit essential oil and 0.2% patchouli oil fixative. This is because the limonene compound found in grapefruit peel is what makes grapefruit peel essential oil have a distinctive aroma.

Financial Feasibility Analysis

Table 4 Results of Aromatherapy Candle Business Feasibility Analysis

Investment Cost	Rp. 917.000
Variable Cost	Rp. 4.280.000
Fixed Fee	Rp. 185.000
Depreciation Expense	Rp 11.664
Total Operating Costs	Rp. 4.476.664
Total Sales Proceeds	Rp. 5.000.000
Profit	Rp. 523.336
BEP (break even point) Production	179 aromatherapy candles
BEP (break even point) Price	Rp. 22.383
BCR (Benefit Cost Ratio)	1.11
Payback Period	51 Days

Based on the calculation results presented in the table above, the investment capital will

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Journal of Agriculture (JoA)
Volume: 1 | Number 3 | November 2022
E-ISSN: 2829-2421
https://doi.org/10.47709/joa.v1i03.2471

return after production runs for 51 production days.

Conclusion

Based on the results of the study, it can be concluded as follows.

1. The best color formulation of aromatherapy candles tastes in A3 treatment with a color concentration of 1.5% with an average of 3.6.
2. The best aromatherapy candle aroma formulation is in the B3 treatment with a grapefruit oil concentration of 2.5% and patchouli oil fixative of 0.25% with an average hedonic test result of 4.36.
3. The best aromatherapy candle effect formulation was in the B3 treatment with a concentration of grapefruit oil of 2.5% and patchouli oil fixative of 0.25% with an average result of organoleptic test of 6.52.and 80% of panelists felt relaxed, comfortable, fresh, and somewhat refreshed.
4. The results of the analysis of the calculation of the Benefit Cost Ratio (BCR) in the Aromatherapy business with a BCR value of 1.11, it is stated that this business is worthy of development.

Acknowledgements

We would like to thank all parties who have assisted in this research process, especially the staff of Technical Staff for the Pangkep State Agricultural Polytechnic.

References

Buchbauer, G., W. Jager, H. Dietrich, Ch. Plank, and E. Karamat. 1991. "Aromatherapy: Evidence for sedative Effects of Essential Oil of Lavender after Inhalation". Journal of Biosciences. 46c,1067-1072

Faidliyah. (2017). Pembuatan Lilin Aroma Terapi Berbasis Bahan Alami. Jurnal Prodi Teknik Kimia Institut Teknologi Malang.

Iryani. (2018). Pembuatan Minyak Atisiri Dari Kulit Jeruk Purut (Citrus Histirix) Dengan Metode Ekstraksi. Prosiding Seminar Hasil Penelitian (Snp2m).

Ketaren, S. (1985). Pengaruh Teknologi Minyak Atsiri. Jakarta: Balai Pustaka.

Lutfiah Nur Hidayati, &. D. (2020). Pelatihan Pembuatan Lilin Aromaterapi Dengan Kulit Jeruk Pecel (Citrus Aurantifolia) Daun Kemangi (Ocimum Sanctum) Menggunakan Metode Ekstraksi Di Masa Pandemi Covid-19. Arikel Ilmiah

Makkulau, A. R. (2017). Analisis Lama Penyulingan Terhadap Rendemen Minyak Atsiri Kulit Jeruk Pangkep (Citrus Maxima) Dengan Metode Basah Dan Kering. Prosiding Seminar Hasil Penelitian.

Murniyawati, M. D. (2016). Microwave Assisted Hydrodistillation Untuk Ekstraksi Minyak Atsiri Dari Kulit Jeruk Bali Sebagai Lilin Aromaterapi. Jurnal Bahan Alami Terbarukan.

Nur Istikomah, N. H. (2016). Pengaruh Ekstrak Kulit Jeruk Pamelo Terhadap Infeksi Jamur Fausanium Oxysporum Pada Tanaman Tomat. Jurnal Sains Dan Seni ITS.

Petrus Patandung, D. (2018). Pengaruh Suhu Parafin Cair Terhadap Waktu Penyimpanan Simpan Jahe. Teknologi Industri, 45-50.

Primadiati, Rachmi. 2002. Aromaterapi Perawatan Alami untuk Sehat dan Cantik. Jakarta: PT

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Gramedia Pustaka Utama.

Purba, C. M. (2017). Formulasi Gel Pengharum Ruangan Menggunakan Karagenan, Agar Dan Pektin Dengan Minyak Grapefruit Sebagai Pewangi

Sastroamidjojo, H. 2004. Kimia Minyak Atsiri. Gajah Mada University Press, Yogyakarta.

Sipahelut, S. G. (2018). Efektifitas Lilin Aromterapi Minyak Atsiri Daging Buah Pala Terhadap Kesukaan Konsumen. Sains Dan Teknologi Pangan (Jstp).

Standard Nasional Indonesia, 2010. Spesifikasi Persyaratan Mutu Minyak Nilam

Ummu Kalsum, S. S. (2020). Karakteristik Morfologi Buah Dan Biji Jeruk Pamelo Berbiji Dan Tidak Berbiji. Jurnal Pertanian Presisi, 54-62.

Vidayanti, E. (2019). Llilin Aroma Terapi Dari Minyak Atsiri Kulit Jeruk Manis (Citrus Sinensis).

This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License