

- Hak Cipta Dilindungi Undang-undang
1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
 2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

INFLUENCE OF TESTING ENVIRONMENTS ON SENSORY ACCEPTANCE OF ORANGE-FLAVORED POWDERED DRINKS AMONG ELEMENTARY STUDENTS

ANINDYA MAHESWARI PARAMITA



**FOOD TECHNOLOGY STUDY PROGRAM
FACULTY OF ENGINEERING AND TECHNOLOGY
IPB UNIVERSITY
BOGOR
2026**



@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.



STATEMENT REGARDING THE THESIS AND SOURCES OF INFORMATION AND COPYRIGHT ASSIGNMENT

I hereby declare that the thesis titled “Influence of Testing Environments on Sensory Acceptance of Orange-Flavored Powdered Drinks among Elementary Students” is my own work, completed under the guidance of my academic advisor, and has not been submitted in any form to any other institution of higher education. Sources of information derived from or cited from published or unpublished works by other authors have been cited in the text and listed in the Bibliography at the end of this thesis.

I hereby transfer the copyright of my written work to the IPB University.

Bogor, June 2026

Anindya Maheswari Paramita
F2401221812



@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.



ABSTRAK

ANINDYA MAHESWARI PARAMITA. Pengaruh Lingkungan Pengujian terhadap Penerimaan Sensori Minuman Serbuk Berperisa Jeruk pada Siswa Sekolah Dasar. Dibimbing oleh DEDE ROBIATUL ADAWIYAH dan HAMZAH RABBANI.

Kesenjangan antara kondisi laboratorium yang terkendali dan konsumsi nyata menjadi tantangan dalam riset sensori anak. Penelitian ini mengevaluasi pengaruh lingkungan pengujian terhadap persepsi sensori minuman serbuk rasa jeruk dengan membandingkan *Controlled Environment Test* (CET) dan *Central Location Test* (CLT) pada 119 panelis anak (usia 9–13 tahun; 81 di CET, 38 di CLT). Evaluasi sensori mencakup skor kesukaan hedonik dan atribut *Just-About-Right* (JAR). Data dianalisis menggunakan ANOVA Dua Arah independen, uji lanjut Tukey's HSD, dan analisis penalti untuk data JAR. Lingkungan pengujian memberikan pengaruh utama yang sangat signifikan terhadap kesukaan konsumen ($p < 0.05$), di mana lingkungan CLT menghasilkan skor hedonik yang lebih tinggi karena adanya efek *hedonic burst* dari konteks dunia nyata. Sebaliknya, pengaruh utama dari formulasi produk tidak signifikan ($p > 0.05$). Efek interaksi yang tidak signifikan ($p > 0.05$) mengonfirmasi bahwa peringkat sensori tetap konsisten di kedua lingkungan. Secara khusus, uji lanjut Tukey's HSD menunjukkan bahwa Produk C mencapai skor penerimaan yang signifikan lebih tinggi dibanding Produk A ($p = 0.028$). Penelitian ini menyimpulkan bahwa konteks situasi merupakan penggerak dominan dari kesukaan anak secara keseluruhan, yang menunjukkan pentingnya mengevaluasi validitas ekologis untuk memetakan preferensi konsumen secara akurat.

Kata kunci: *Central Location Test*, evaluasi sensori, minuman serbuk, pendekatan ekologis, proses transaksional



@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.



ABSTRACT

ANINDYA MAHESWARI PARAMITA. Influence of Testing Environments on Sensory Acceptance of Orange-Flavored Powdered Drinks among Elementary Students. Supervised by DEDE ROBIATUL ADAWIYAH and HAMZAH RABBANI.

The gap between controlled laboratory settings and real-world consumption presents a challenge in children's sensory research. This study evaluated the influence of testing environments on the sensory perception of orange-flavored powdered drinks by comparing a Controlled Environment Test (CET) and a Central Location Test (CLT) among 119 child panelists (aged 9–13 years; 81 in CET, 38 in CLT). Sensory evaluation included hedonic liking scores and Just-About-Right (JAR) attributes. Data were analyzed using independent Two-Way ANOVA, Tukey's HSD post-hoc tests, and penalty analysis for JAR data. The testing environment exerted a highly significant main effect on consumer liking ($p < 0.05$), with the CLT environment yielding higher hedonic scores due to a real-world "hedonic burst." Conversely, the main effect of product formulation was non-significant ($p > 0.05$). A non-significant interaction effect ($p > 0.05$) confirmed that sensory ranking remained consistent across settings. Crucially, pairwise tracking via Tukey's HSD revealed that Product C achieved a significantly higher acceptance score than Product A ($p = 0.028$). This research concludes that situational context is a dominant driver of children's overall liking, highlighting the necessity of evaluating ecological validity to accurately map consumer preferences.

Keywords: Central Location Test, ecological approach, powdered beverage, sensory evaluation, transactional process



Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

© Hak Cipta milik IPB, tahun 2026
Hak Cipta dilindungi Undang-Undang

Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan atau menyebutkan sumbernya. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik, atau tinjauan suatu masalah, dan pengutipan tersebut tidak merugikan kepentingan IPB.

Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apa pun tanpa izin IPB.

INFLUENCE OF TESTING ENVIRONMENTS ON SENSORY ACCEPTANCE OF ORANGE-FLAVORED POWDERED DRINKS AMONG ELEMENTARY STUDENTS

ANINDYA MAHESWARI PARAMITA

Bachelor Thesis
as one of the requirements for obtaining a
Bachelor's degree in the
Food Technology Program

**FOOD TECHNOLOGY STUDY PROGRAM
FACULTY OF ENGINEERING AND TECHNOLOGY
IPB UNIVERSITY
BOGOR
2026**



@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

Examining Team for Bachelor Thesis Examination:

1. Dr. Ing. Dase Hunaefi, S.Tp., M. Food. St
2. Lince, S.T.P., M.P.



Bachelor Thesis : Influence of Testing Environments on Sensory Acceptance
Title of Orange-Flavored Powdered Drinks among Elementary
Students
Name : Anindya Maheswari Paramita
NIM : F2401221812

Approved by

Supervisor 1:
Prof. Dr. Ir. Dede Robiatul Adawiyah, M.Si.
NIP 196805051992032000

Known by

Head of the Study Program:
Dr. Ing. Dase Hunaefi, S.T.P., M.Food.St.
NIP 197912082005011003

Exam Date: 3 July 2026



PREFACE

Praise and gratitude are extended to Allah SWT for His endless blessings, mercy, and guidance, which have enabled the author to successfully complete this undergraduate thesis entitled "Influence of Testing Environments on Sensory Acceptance of Orange-Flavored Powdered Drinks among Elementary Students." Throughout this academic journey, the author has received invaluable guidance, encouragement, and assistance from various parties. Therefore, the author wishes to express her deepest gratitude to:

1. Prof. Dr. Ir. Dede Robiatul Adawiyah, M.Si., as the thesis advisor, for her profound wisdom, continuous guidance, and inspiring patience that steered this research toward completion.
2. Bapak Hamzah Rabbani, S.S. dan Ibu Lince, S.T.P., M.P. as the co-advisor, for providing constructive insights, valuable knowledge, and dedicated support during the development of this study.
3. Dr. Ing. Dase Hunaefi, S.Tp., M. Food. St, as the thesis examiner, for the critical reviews and scholarly suggestions given to improve this work.
4. The principal, teachers, and beloved students of SDN Ciapus 06 and SDIT An-Nur for their warm welcome and enthusiasm during the field data collection.
5. The R&D staff and interns at the internship company for their kindness and joyful working environment.
6. The author's dearest pillars of strength, Papi, Mami, and the extended family, whose endless love and silent prayers have been the foundation of the author's journey.
7. Nida Aulia Wahyudi and Bi Cicih, who walked alongside the author through the research journey.
8. The K4 friends (Vania, Hazim, NC, Raka, and others), who have been there since Day 1, serving as the constant reason why coming to campus every single day felt meaningful and bright.
9. The "Numpang Ya" circle (Feli and others), for being the author's 'go-to' since the beginning of university life.
10. Muhammad Bisma Permana, for always being there and believing in me when I doubted myself.

May this scientific work contribute meaningfully to the advancement of food and sensory science.

Bogor, June 2026

Anindya Maheswari Paramita

TABLE OF CONTENTS

LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDICES	xi
LIST OF ABBREVIATIONS	xii
I INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	2
1.3 Objective	2
1.4 Benefits	2
II LITERATURE REVIEW	3
2.1 Powdered Fruit-Flavored Drinks	3
2.2 Sensory Evaluation in Children	3
2.3 Contextual Sensory Testing	4
2.3.1 Controlled Environment Test	4
2.3.2 Central Location Test	5
2.3.3 The Spillover Effect in Sensory Perception	5
2.4 Ecological Value Method	5
2.5 Hedonic and JAR Scales	6
III METHODS	7
3.1 Time and Location	7
3.2 Material and Equipment	7
3.3 Working Procedure	8
3.3.1 Development of Research Instrument	8
3.3.2 Panelist Screening	9
3.3.3 Sample Preparation	11
3.3.4 Test Procedure	12
3.4 Data Analysis	13
IV RESULTS AND DISCUSSION	15
4.1 Demographic Characteristics of Panelists	15
4.1.1 Panelist Characteristics	15
4.1.2 Hedonic Distribution and Top 2 Boxes (T2B) Analysis	16
4.2 Statistical Assumption Testing	19
4.3 Sensory Acceptance (Hedonic Test)	20
4.4 Diagnostic Attributes (Just-About-Right)	24
4.4.1 JAR Sample A	24
4.4.2 JAR Sample B	27
4.4.3 JAR Sample C	30
4.5 The Interaction Between Environmental Context and Sensory Perception in Child Consumers	33
4.5.1 Environmental Modulation of Consumer Affect in Diverse Settings	33
4.5.2 Sensory Robustness and Preference Stability	34
4.6 Field Execution Challenges and Potential Biases	34
4.6.1 Sensory Robustness and Preference Stability	34
4.6.2 Panelist Engagement and Social Biases	34
4.6.3 Sample Size Disparity	35
V CONCLUSIONS AND RECOMMENDATIONS	37



REFERENCES
APPENDICES
BIOGRAPHY

5.1	Conclusions	37
5.2	Recommendations	37
	REFERENCES	38
	APPENDICES	43
	BIOGRAPHY	51

@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

LIST OF TABLES

1	Sample distribution and randomized serving order for CET	11
2	Sample distribution for CLT	12
3	Profile and consumption patterns of CET and CLT method panelists	15
4	Top 2 Boxes (T2B) percentage of consumer acceptance for orange-flavored powdered drink samples in CLT and CET settings	18
5	Normality test results of the hedonic score residuals	19
6	Homogeneity of variance test result (Levene's test)	20
7	ANOVA on the effects of testing environment method and product type on consumer hedonic scores	21
8	Two-way ANOVA summary of testing environment and product type	22
9	Mean consumer acceptance scores with significance superscript letters	23
10	Disparity in sample sizes and operational limitations	36

LIST OF FIGURES

1	Seven-face TASTY scale (Wagner et al. 2020)	6
2	Panelist identification and tracking coupon for CLT sessions	10
3	Research procedure flowchart	14
4	Relative frequency distribution of hedonic scores across CET (a) and CLT (b) locations for three orange-flavored powdered drink samples	17
5	Estimated marginal means of Products A, B, and C	23
6	Estimated marginal means of testing location	23
7	Estimated marginal means of products across testing locations	23
8	Distribution of JAR responses for Sample A evaluated in different testing environments: (a) CET and (b) CLT, description: Blue = too weak; green = JAR; red = too strong, threshold 20%	24
9	JAR penalty analysis results for Sample A evaluated in different testing environments: (a) CET and (b) CLT, description: blue = too weak; red indicates “too strong”	26
10	Distribution of JAR responses for Sample B evaluated in different testing environments: (a) CET and (b) CLT, description: Blue = too weak; green = JAR; red = too strong, threshold 20%.	28
11	JAR penalty analysis results for Sample B evaluated in different testing environments: (a) CET and (b) CLT, description: blue = too weak; red indicates “too strong”	29
12	Distribution of JAR responses for Sample C evaluated in different testing environments: (a) CET and (b) CLT, description: Blue = too weak; green = JAR; red = too strong, threshold 20%.	30
13	JAR penalty analysis results for Sample C evaluated in different testing environments: (a) CET and (b) CLT, description: blue = too weak; red indicates “too strong”	32



LIST OF APPENDICES

1	Research schedule	44
2	Documentation of Controlled Environment Test Execution	44
3	Documentation of Central Location Test Execution	44
4	CET evaluation form (Sample A)	45
5	CET evaluation form (Sample B&C)	46
6	CLT evaluation form	47
7	Parental consent form for CET in SDS An-Nur Ciomas	48
8	Parental consent form for CLT in SDN Ciapus 06	49
9	Data Coding Key and Research Codebook	50
10	Tukey's HSD post-hoc test results	51



LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CET	Controlled Environment Test
CLT	Central Location Test
EVM	Ecological Value Method
HSD	Honestly Significant Difference
JAR	Just-About-Right
SSB	Sugar-Sweetened Beverage
F2B	Top 2 Boxes

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.