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EDUCATION

1996-2000: **School of Food Science and Technology, Wuxi University of Light Industry, Wuxi, Jiangsu Province:** Bachelor's degree in Food Engineering, July 2000

2003-2006: **School of Food Science and Technology, Southern Yangtze University, Wuxi, Jiangsu Province:** Master's degree in Food Science and Technology, July 2006

2007-2010: **School of Food Science and Technology, Jiangnan University, Wuxi, Jiangsu Province:** Candidate for PhD in Food Science and Technology

EXPERIENCE & TRAINING

2008-2010: Research on Quick Freeze-drying of Fresh-cut Vegetables Based on Combinative (Osmotic, Microwave-vacuum) Dehydration Process and Study on Storage Mechanisms of the Dried Products

2004-2006: Research on production, purification and characterization of an endoinulinase from *Penicillium purpurogenum*

1999-2000: Studies on a New Flavor Ham Product: manufacture and color stabilization

Studies on the effects of different drying methods on the quality of edible fresh vegetables: case of the main pigments and nutrients of carrots

Advisor: Prof. Min Zhang, Jiangnan University, Wuxi, China

Co-Advisor: Prof. Arun S. Mujumdar, National University of Singapore, Singapore

Abstract

Introduction

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1.2. History of drying in food processing technology

1.2.1. General considerations

1.2.2. Case of vegetable processing mainly focusing on carrots

1.3. Reviewing the different drying techniques applicable to carrots

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1.3.1.1. Shelf life considerations

1.3.1.2. Convenient and snack food considerations

1.3.1.3. Ingredient for new food formulations

1.3.2. Adverse effects on carrot drying

1.3.2.1. From the point of view of the stability of the main pigments during the drying process

1.3.2.1. Stability of other main nutrients during the drying processes

1.4. Categorizing the carrots among the functional foods

1.4.1. Defining and understanding the meaning of functional food

1.4.2. Role of different pigments in functional properties of carrots

- 1.4.2.1. Main pigments
 - 1.4.2.1.1. Beta carotene
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- 1.4.2.2. Minor pigments
- 1.4.3. Vitamin C in carrots
- 1.5. Methods of extracting and analyzing the pigments of carrots
 - 1.5.1. Sample preparations
 - 1.5.2. Open Column Chromatography
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- 1.6. Objectives of this thesis
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 - 1.6.2. Focus on the physical properties of carrots
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Chapter4. Effects of freeze drying (FD) on contents of alfa and beta carotenoids

Chapter5. Effects of Microwave Vacuum Freeze Drying (MFD) on contents of alfa and beta carotenoids

Chapter6. Effects of osmodehydration (OD) on the contents of alfa and beta carotenoids

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- 6.1. Combining microwave vacuum and hot air drying of carrots
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- 8.2. Judging the drying methods based on the analysis of physical changes in the dried product
 - 8.2.1. Size, shape, volume, density, porosity, shrinkage of dried products from different drying techniques
 - 8.2.2. Water activity of dried products from different drying techniques
 - 8.2.3. Moisture sorption isotherms of dried products from different drying techniques
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- 8.3. Subjective sensory evaluation of dried products from different drying techniques
 - 8.3.1. Color
 - 8.3.2. Sweetness
 - 8.3.3. Texture
 - 8.3.3.1. Crispiness
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- 8.4. Objective sensory evaluation of texture by TPA (texture profile analysis)
- 8.5. Structural analysis of the dried products by SEM (scanning electron microscope)
- 8.6. Considering other nutritive qualities in dried products from different drying techniques
 - 8.6.1. Analysis of the content of Vitamin C
 - 8.6.1.1. Vitamin C in fresh carrots
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 - 8.6.2. Analysis of total sugars

8.6.2.1. Contents of sugars in the raw material

8.6.2.2. Content of sugars in the dried carrots

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9.2. General discussion of the results

9.2. General conclusions

9.3. Recommendations

10. References