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Titolo	La forge à la catalane dans les Pyrénées ariégeoises : Une industrie à la montagne (XVIIe –XIXe siècle) / / Jean Cantelaube
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Sommario/riassunto	Du xiiie à la fin du xixe siècle, de la mouline médiévale à la forge à la catalane, les Pyrénées sont restées fidèles au procé-dé de réduction directe du minerai de fer. Comprendre pour-quoi les Pyrénées ont conservé ce procédé tout en choisissant au xviie siècle une méthode sidérurgique et une forge inno-vantes qualifiées de « à la catalane » constitue l'objet de ce livre. La réponse traditionnelle, convoquant archaïsme et routine, n'est pas satisfaisante. La sidérurgie des Pyrénées ariégeoises, industrie à la montagne, constitue un « système productif local » obéissant à des logiques techniques, sociales et économiques dans un écosystème ingrat. Pour relever le défi de la nature, les communautés des hautes vallées ont développé des mécanismes d' exploitation pastorale, forestière et minière. Autour de la forge à la catalane, dans un monde agro-pastoral, chacune d'elles a engendré des dyna-miques particulières, recherchant le meilleur développement possible, y ajoutant les migrations professionnelles des forgeurs, mineurs et charbonniers dans une aire technique élargie, alors que le déséquilibre entre les hommes et les ressources s'accentue. Le savoir-faire singulier des forgeurs joue le premier rôle dans la pratique quotidienne de cette industrie (sensations, observations et gestes), bel

exemple de « culture technique d'un territoire ». Il était donc impératif de donner une définition précise de la forge à la catalane, techniquement assurée et historiquement documentée, bref de traiter cette très célèbre forge en objet historique. Les résultats de cette étude ont fixé le cadre chronologique, la période à la catalane du xviie au xixe siècle. Finalement, la démarche historique a permis de mettre en lumière la complexité de la sidérurgie directe des Pyrénées. Pour mener à bien ce travail, l'historiographie des deux versants des Pyrénées a été mise à contribution.

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Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- List of Contributors -- Preface -- Acknowledgments -- Chapter 1 Freeze-Drying: Basic Principles and Processes -- 1.1 Introduction -- 1.2 Principle of FD Process -- 1.2.1 Freezing of Raw Material -- 1.2.2 Primary Drying - Sublimation -- 1.2.3 Second Drying - Desorption -- 1.3 Basic Components of a Typical Freeze-Dryer System -- 1.4 Types

of FD Processes -- 1.4.1 Vacuum FD -- 1.4.2 Atmospheric FD -- 1.4.3 Spray FD -- 1.5 Characterization of FD Samples -- 1.5.1 Color -- 1.5.2 Moisture -- 1.5.3 Scanning Electron Microscopy -- 1.5.4 Thermal Analysis -- 1.5.5 Rehydration Characteristics -- 1.6 Applications of FD in Food Processing -- 1.6.1 Fresh Produce -- 1.6.2 Animal Products -- 1.6.3 Dairy Products -- 1.6.4 Miscellaneous Applications -- 1.7 Advantages of FD -- 1.8 Limitations of FD -- 1.9 Commercial Status -- 1.9.1 Technological Applications in Food -- 1.10 Conclusion and Future Perspectives -- References -- Chapter 2 Mathematical Modeling of Freeze-Drying Process -- 2.1 Introduction -- 2.2 Principle of Freeze-Dryer -- 2.2.1 Vacuum Freeze-Drying -- 2.2.2 Atmospheric Freeze-Drying -- 2.2.3 Water Vapor Transfer in Freeze-Dryer -- 2.3 Mathematical Model for Freezing -- 2.3.1 Thermal Balance during Freezing -- 2.3.2 Examples of Simulation Results -- 2.4 Mathematical Expression of the Progress of Freeze-Drying -- 2.4.1 Primary Drying -- 2.4.2 Secondary Drying -- 2.4.3 Practical Approach for Modeling of Freeze-Drying -- 2.5 One-Dimensional Model (Rp-Kv Model) -- 2.6 Three-Dimensional Model (Kcc Model) -- 2.6.1 Case Classification of Freeze-Drying under Radiative Heat -- 2.6.2 Radiative Heat to Product -- 2.6.3 Radiative Heat to Tray -- 2.6.4 Conductive Heat Transfer in the Frozen and Dried Layers -- 2.6.5 Three-Dimensional Model (Kcc Model) - Water Vapor Transfer.
2.6.6 Parameter Estimation by Ice Sublimation Test -- 2.6.7 Estimation of Essential Surface Area -- 2.6.8 Simulation Result Example -- 2.7 Conclusion -- References -- Chapter 3 Freeze Drying of Fruits and Vegetables -- 3.1 Introduction -- 3.2 Physical Characteristics of Freeze-Dried Fruits and Vegetables -- 3.2.1 Color -- 3.2.2 Shrinkage -- 3.2.3 Rehydration Capacity -- 3.2.4 Microstructure -- 3.3 Biochemical Characteristics of Freeze-dried Fruits and Vegetables -- 3.3.1 Antioxidant Activity -- 3.3.2 Polyphenols -- 3.3.3 Ascorbic Acid -- 3.4 Freeze Drying for Encapsulation -- 3.5 Applications of Freeze-dried Fruits and Vegetables -- 3.6 Advantages and Disadvantages of Freeze Drying -- 3.7 Conclusion -- References -- Chapter 4 Freeze-Drying of Meat and Seafood Products -- 4.1 Introduction -- 4.2 Principles of Freeze-Drying Technology -- 4.3 Effect of Freeze-Drying on the Sensory Attributes of Meat and Seafood Products -- 4.3.1 The Challenge of Imitating Fresh Meat -- 4.3.2 The High Opportunities of Freeze-Drying in Seafood -- 4.4 Stability of Freeze-Dried Meat and Seafood Products -- 4.4.1 Advantages and Disadvantages in the Preservation of Meat by Freeze-Drying -- 4.4.2 Suitability of Freeze-Drying to Stabilize Seafood Products -- 4.5 Conclusions -- Acknowledgments -- References -- Chapter 5 Freeze-Drying of Dairy Products -- 5.1 Introduction -- 5.2 Application of Freeze-Drying in Different Dairy Products/Ingredients -- 5.2.1 Milk -- 5.2.2 Cheese -- 5.2.3 Yogurt -- 5.3 Application of Freeze-Drying of Other Dairy Products -- 5.3.1 Lactic Acid and Other Cultures -- 5.3.2 Application of Freeze-Drying on Colostrum -- 5.3.3 Application of Freeze-Drying on Lactoferrin -- 5.4 Spray Freeze-Drying -- 5.4.1 Parameter of Spray Freeze-Drying -- 5.5 Advanced Freeze-Drying Methods -- 5.5.1 Infrared Freeze-Drying -- 5.5.2 High-Pressure Freeze-Drying.
5.5.3 Microwave Freeze-Drying (MWFD) -- 5.6 Conclusion -- References -- Chapter 6 Freeze-Drying of Probiotics for the Incorporation in Functional Foods: Drying Process, Viability, and Powder Properties -- 6.1 Introduction -- 6.2 Functional Foods -- 6.3 Cultivation and FD of Probiotics -- 6.4 Protection of Probiotics During FD -- 6.5 Stability and Viability Assessment After FD -- 6.5.1 Factors Affecting Survival and Stability -- 6.5.2 Protective Agents to Improve Viability -- 6.6 Properties of Freeze-Dried Probiotic Powders -- 6.6.1

Comparison of Spray-Dried and Freeze-Dried Probiotic Powders -- 6.7 Rehydration of Freeze-Dried Probiotics -- 6.8 Conclusion and Future Trends -- References -- Chapter 7 Freeze-Drying Effect on Nutrients and Their Stability -- 7.1 Introduction -- 7.1.1 Food Quality Changes During Drying of Food -- 7.1.2 Freezing Process -- 7.1.3 Combined Application of Different Freeze-Drying Methods -- 7.2 Vitamin -- 7.3 Minerals -- 7.3.1 Microminerals -- 7.3.2 Macro-minerals -- 7.4 Bioactive Compounds -- 7.4.1 Antioxidant Activity -- 7.4.2 Anthocyanin -- 7.4.3 Carotenoids -- 7.5 Future Perspective -- 7.6 Conclusion -- References -- Chapter 8 Packaging of Freeze-Dried Products -- 8.1 Introduction -- 8.2 History of Freeze-Dried Foods -- 8.3 Industrial Process of Freeze Drying -- 8.3.1 Pre-Treatment Methods of Various Foods Before Freeze-Drying -- 8.4 Need for Good Packaging for Freeze-Dried Food Products -- 8.4.1 Microbial Quality -- 8.4.2 Chemical Quality -- 8.4.3 Nutritional Quality -- 8.4.4 Influence of Storage Quality -- 8.5 Selection of Packaging Material -- 8.5.1 Water Vapor Transmission Rate (WVTR) -- 8.5.2 Gas Transmission Rate -- 8.5.3 Tensile Strength and Elongation -- 8.5.4 Tear Strength -- 8.5.5 Heat Seal Strength -- 8.5.6 Performance Properties -- 8.6 Types of Packaging for Freeze-Dried Foods.
8.6.1 Modified Atmosphere Packaging (MAP) -- 8.6.2 Flexible Packaging -- 8.6.3 Shrink Film -- 8.6.4 Cardboard Packaging -- 8.6.5 Wax-Coated Cardboard -- 8.6.6 Edible Films -- 8.6.7 Cans and Glass Jars -- 8.7 Quality Consideration During Packaging -- 8.8 Case Studies of the Packaging of Freeze-Dried Food Products -- 8.8.1 Packaging of Strawberries -- 8.8.2 Packaging of Sour Cherries -- 8.9 Market Scenario -- 8.9.1 Asia-Pacific -- 8.9.2 European Market -- 8.9.3 Freeze-Dried Food Market: Recent Developments -- 8.10 Sustainability Aspects -- 8.11 Safety Aspects of Freeze-Dried Product Packaging -- 8.12 Principal Instrumental Techniques Employed for Packaging Controls -- 8.12.1 Spectrophotometry -- 8.12.2 Thermal Analysis Techniques -- 8.12.3 Gas Transmission Analysis -- 8.13 Conclusion and Future Scope -- References -- Chapter 9 Advances in Freeze Drying to Improve Efficiency and Maintain Quality of Dehydrated Fruit and Vegetable Products -- 9.1 Introduction -- 9.2 Challenges in Freeze Drying -- 9.2.1 Enhancement of Drying Kinetics -- 9.2.2 Energy Intensity Reduction -- 9.2.3 Scale-Up and Technical Transfer -- 9.3 Novel Freeze Drying Systems -- 9.3.1 Infrared-Assisted Freeze Drying -- 9.3.2 Microwave-Assisted Freeze Drying -- 9.3.3 Ultrasound-Assisted Freeze Drying -- 9.4 Conclusion and Future Prospects -- References -- Chapter 10 Commercial Applications of Freeze Drying in Food Processing -- 10.1 Introduction -- 10.2 Commercial Applications of Freeze-Dried Products -- 10.2.1 Food Industry -- 10.2.2 Dairy Industry -- 10.2.3 Other Industry -- 10.3 Cost Analysis of Freeze-Dried Food Products -- 10.4 Industries Freeze-Drying Operation -- 10.4.1 Pretreatments -- 10.4.2 Freezing -- 10.4.3 Primary Drying -- 10.4.4 Secondary Drying -- 10.4.5 Factors Affecting the Quality and Uniformity of Freeze-Dried Products -- 10.5 Industrial Freeze-Drying Device.
10.5.1 Air Blast Freezer -- 10.5.2 Fluidized Bed Freezers -- 10.5.3 Contact Freezer -- 10.5.4 Immersion Freezer -- 10.5.5 Plate Freezer -- 10.5.6 Cryogenic Freezers -- 10.6 Future Prospects -- 10.7 Conclusions -- References -- Index -- EULA.

Sommario/riassunto

This comprehensive volume explores the principles, processes, and applications of freeze-drying in the food industry. Edited by experts Roji Balaji Waghmare, Manoj Kumar, and Parmjit Singh Panesar, it covers the foundational aspects of freeze-drying technology, including the stages of freezing, primary drying, and secondary drying. The book

delves into mathematical modeling and practical approaches for optimizing freeze-drying processes. It examines the impact on various food categories such as fruits, vegetables, meat, seafood, dairy products, and probiotics. The text highlights the advantages and limitations of freeze-drying, its effect on nutritional stability, and emerging methodologies like microwave-assisted and infrared freeze-drying. Aimed at food engineering professionals and researchers, it serves as a valuable resource for understanding the technical and commercial aspects of this preservation method.