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RECEIVED 30 September 2023

ACCEPTED 05 February 2024

PUBLISHED 21 February 2024

CITATION

Bragazzi NL, Woldegerima WA and Siri A.
(2024) Economic microbiology: exploring
microbes as agents in economic systems.
Front. Microbiol. 15:1305148.
doi: 10.3389/fmicb.2024.1305148

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Economic microbiology: exploring microbes as agents in economic systems

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Microbial communities exhibit striking parallels with economic markets, resembling intricate ecosystems where microorganisms engage in resource exchange akin to human market transactions. This dynamic network of resource swapping mirrors economic trade in human markets, with microbes specializing in metabolic functions much like businesses specializing in goods and services. Cooperation and competition are central dynamics in microbial communities, with alliances forming for mutual benefit and species vying for dominance, similar to businesses seeking market share. The human microbiome, comprising trillions of microorganisms within and on our bodies, is not only a marker of socioeconomic status but also a critical factor contributing to persistent health inequalities. Social and economic factors shape the composition of the gut microbiota, impacting healthcare access and quality of life. Moreover, these microbes exert indirect influence over human decisions by affecting neurotransmitter production, influencing mood, behavior, and choices related to diet and emotions. Human activities significantly impact microbial communities, from dietary choices and antibiotic use to environmental changes, disrupting these ecosystems. Beyond their natural roles, humans harness microbial communities for various applications, manipulating their interactions and resource exchanges to achieve specific goals in fields like medicine, agriculture, and environmental science. In conclusion, the concept of microbial communities as biological markets offers valuable insights into their intricate functioning and adaptability. It underscores the profound interplay between microbial ecosystems and human health and behavior, with far-reaching implications for multiple disciplines. To paraphrase Alfred Marshall, "the Mecca of the economist lies in economic microbiology."

KEYWORDS

economic biology, microbiology, microbiobiodiversity, biological markets, mathematical modeling

Economic Microbiology Food Microbiology Economic Microbiology

P.S. Hughes, G.M. Walker



Economic Microbiology Food Microbiology Economic Microbiology:

Economic Microbiology: Primary Products of Metabolism A.H. Rose, 2012-12-02 Economic Microbiology Volume 2

Primary Products of Metabolism is part of a multi volume series that aims to provide authoritative accounts of the many facets of exploitation and control of microbial activity. It discusses the production of industrially important chemicals by microbiological processes specifically the production of primary products of metabolism. This volume includes accounts of the production of organic acids, nucleotides and amino acids which form large and stable sectors of the microbiological industries. It also provides information on polysaccharide fermentations which are currently undergoing extensive development. Further there are discussions of the production of lipids and polyhydroxy alcohols which have yet to be introduced on a commercial scale but could well become economically viable in the near future. Finally there is also an account of the production of acetone and butanol by bacteria. This fermentation process featured significantly in the career of Chaim Weizmann, the first President of the State of Israel and it is still operated in some countries. *Official Gazette Philippines, 2007*

Biotechnology in Flavor Production Daphna Havkin-Frenkel, Nativ Dudai, 2016-08-02 Throughout history human beings have sought ways to enhance the flavor of the foods they eat. In the 21st century biotechnology plays an important role in the flavor improvement of many types of foods. This book covers many of the biotechnological approaches currently being applied to flavor enhancement. The contribution of microbial metabolism to flavor development in fermented beverages and dairy products has been exploited for thousands of years but the recent availability of whole genome sequences of the yeasts and bacteria involved in these processes is stimulating targeted approaches to flavor enhancement. Chapters discuss recent developments in the flavor modification of wine, beer and dairy products through the manipulation of the microbial species involved. Biotechnological approaches to the production of specific flavor molecules in microbes and plant tissue cultures and the challenges that have been encountered are also covered along with the metabolic engineering of food crops for flavor enhancement. Also a current area of research, biotechnology is also being applied to crop breeding through marker assisted selection for important traits including flavor and the book looks at the application of the biotechnological approach to breeding for enhanced flavor in rice, apple and basil. These techniques are subject to governmental regulation and this is addressed in a dedicated chapter. This updated second edition features five brand new chapters and the topics covered in the book will be of interest to those in the flavor and food industries as well as to academic researchers interested in flavors.

Psychotropic Bacteria in Foods Disease and Spoilage Allen A. Kraft, 1992-07-06 Psychrotrophic Bacteria in Foods Disease and Spoilage presents a comprehensive review of psychrotrophic bacteria and other pathogens and their role in causing food spoilage in refrigerated and frozen foods. The book focuses on the growth, survival and subsequent activity of these organisms especially in meat and poultry products. Metabolic products of bacterial growth in foods as indicators of spoilage are described. The book also discusses the potential microbiological hazard posed to new generation minimally processed

refrigerated foods Psychrotrophic Bacteria in Foods Disease and Spoilage is an informative reference for food microbiologists and other food scientists working in industry and academia It will also be useful to researchers and personnel in regulatory agencies **National Library of Medicine Current Catalog** National Library of Medicine (U.S.), *Handbook of Biocide and Preservative Use* H.W. Rossmoore,2012-12-06 My professional interest in antimicrobial agents and contamination control goes back 50 years to my tour as a microbiologist in a field hospital in Europe during World War II With no experience and relying solely on a military handbook I prepared thermometer trays with jars of blue bichloride of mercury and pink isopropyl alcohol A preliminary typhoid diagnosis of one of our cooks resulted in the need for lab testing His stool specimen and its subsequent disposal was my problem My handbook said bum it So burn it I did in a five gallon can with gasoline Flames shot up almost six feet and my next mistake was to extinguish them with carbon tetrachloride This resulted in the production of lethal phosgene gas The hospital had a near disaster I could say that at that moment I vowed to write a how to book so that such stupidities could be avoided Nevertheless when I was offered the opportunity to edit this book I thought back on the need for a real practical treatment of my subject This book then is a practical handbook for technical service personnel and scientists who are not necessarily specialists in microbiology It provides information on suitable antimicrobial agents appropriate to their particular problem solving needs and information on the microbial groups contributing to the specific problem their ecologies and strategies for controlling their access to the area or material of interest **Fermented Foods and Beverages of the World** Jyoti Prakash Tamang,Kasipathy Kailasapathy,2010-07-01 Did you know It is estimated that fermentation practices have been around since as early as 6000 BC when wine was first being made in Caucasus and Mesopotamia Today there are roughly 5000 varieties of fermented foods and beverages prepared and consumed worldwide which accounts for between five and forty percent of daily meals Fermented Foods a *Bioreactor System Design* Juan A. Asenjo,1994-11-17 Describes the state of the art techniques and methods involved in the design operation preparation and containment of bioreactor systems taking into account the interrelated effects of variables associated with both upstream and downstream stages of the design process The importance of the initial steps in the development of a bioprocess such as strain and media selection that have an overwhelming influence on all further operations is emphasized This work is intended for biochemical chemical and bioprocess engineers biotechnologists industrial biochemists micro and molecular biologists food scientists and upper level undergraduate and graduate students in these disciplines *Economics of food processing in the United States* Chester O. Jr. McCorkler,2012-12-02 Economics of Food Processing in the United States aims to provide an economic overview of the food processing industries in the United States to explore the firm level implications of social economic technological and institutional forces for selected food processing industries and to uncover some of the implications for consumers raw product producers and the national economy of the major trends observed in food industries The book begins by evaluating the major forces shaping demand supply prices and trade in processed foods It then considers

major trends in technical processes major forces in marketing distribution and structure and major trends in regulation The next few chapters explore these trends for five specific food processing industries which represent major types of products processed fruits and vegetables meat milk grain and soybeans and wine After the specific industries have been examined the final two chapters treat these industries in the context of the national and international economy Students preparing for careers researchers and industry participants who study these firms and industries and the various approaches to solving their economic and management problems will benefit from the information in this volume and from its approach to presenting the dynamics of the food processing industries

Enzymes of Psychrotrophs in Raw Food Robin C. McKellar, 2020-11-25 This book draws together theoretical and applied aspects of extracellular hydrolytic enzymes in spoilage and thus provides information and analysis of interest to microbiologists and biochemists as well as up to date methods and recommendations of value to food scientists and processors The first section deals with psychrotroph proteinases lipases and phospholipases in milk and dairy products and covers such aspects as producer microorganisms biochemical classification of enzymes physical and biochemical properties thermal stability regulation and control of synthesis and assay methods Particular emphasis is placed on commercially important areas such as physical and biochemical effects in food components and influence on shelf life and product quality The problems of standardization and control of enzymes in dairy products as well as areas for future research are critically examined The poorly understood role of psychrotroph extracellular enzymes in meat fish and poultry is also discussed in a separate section under such headings as physical and biochemical effects on tissue and contribution to growth and penetration of the producer organism

Distilled Spirits, Volume 3 P.S. Hughes, G.M. Walker, 2010-12-01 Discussing the worldwide traditions and innovations associated with the production of distilled spirits this comprehensive reference emphasizes the importance of continuing to have a supply of high quality raw materials as modern agricultural practices change The source material for this study originated in the 2008 Worldwide Distilled Spirits Conference where hundreds of distillers from around the world gathered to share knowledge under the theme of energy environment and enlightenment to meet the challenges of the future Tackling environmental issues and emphasizing the importance of high quality distilling this sourcebook is an essential reference for distillers brewers research institutes and anyone with an interest in spirits

Current Catalog National Library of

Medicine (U.S.), 1983 First multi year cumulation covers six years 1965 70

Yeasts in Natural and Artificial Habitats John F.T. Spencer, Dorothy M. Spencer, 2013-03-09 A Guide to the World of the Yeasts J F T Spencer and D M Spencert As the well known authority on yeasts the late Professor Rose frequently pointed out it is impossible for one person to present in a single volume the details of the life composition habitats relationships and actual and potential uses to man kind of the 500 at last count known species of yeasts This book confirms the truth of this statement However our aim is actually more modest than that and this book is an attempt to introduce the general reader and possibly some inter ested specialists to the lives of

the yeasts in their natural and more artificial habitats their use by human beings and to give some idea of the wonderfully complex activities within the yeast cell the characteristics of the metabolism and molecular biology of yeasts and the applications of these characteristics to life in the present day world of human existence The book proceeds from a brief chapter on what is and is not known of the origins and early history of the yeasts through a description of their classification relationships habitats and general life style their external morphology and internal structures and mechanisms within their cells the regulatory mechanisms controlling processes such as signal transmission mating cell fusion and many others A

Stakeholder Approach to Managing Food Adam Lindgreen, Martin K. Hingley, Robert J. Angell, Juliet Memery, 2016-08-05 This research anthology explores the concept of food production and supply from farm gate to plate bringing together contemporary thinking and research on local national and global issues from a stakeholder perspective A Stakeholder Approach to Managing Food includes a number of sections to represent these challenges opportunities conflicts and cohesions affecting relevant stakeholder groups within food production and supply and their reaction to engagement with and co creation of the food environment For some local national and global interests may seem at odds We are in an era of growing and pervasive multi national corporations and these corporations have significant influence at all levels Rapidly growing economies such as China are a focus for the global brand but is this a scenario of adaptation or homogenization of food Alongside this trend toward national and global development in food this volume presents the counter reaction that is taking place especially in developed countries toward local speciality and culturally bound foods with emphasis on the importance of the inter connection of local communities and agri food culture and economy With an in depth analysis of agricultural businesses this book shows that the entrepreneurial spirit is alive and well in rural communities with often renewed and engaged connection with consumers and imaginative use of new media This book will be of interest to students researchers and policy makers concerned with agriculture food production and economics cultural studies **Wine** Joke

Bakker, Ronald J. Clarke, 2011-10-13 *Wine Flavour Chemistry* brings together a vast wealth of information describing components of wine their underlying chemistry and their possible role in the taste smell and overall perception It includes both table wines and fortified wines such as Sherry Port and the newly added Madeira as well as other special wines This fully revised and updated edition includes new information also on retsina wines ros s organic and reduced alcohol wines and has been expanded with coverage of the latest research Both EU and non EU countries are referred to making this book a truly global reference for academics and enologists worldwide *Wine Flavour Chemistry* is essential reading for all those involved in commercial wine making whether in production trade or research The book is of great use and interest to all enologists and to food and beverage scientists and technologists working in commerce and academia Upper level students and teachers on enology courses will need to read this book wherever food and beverage science technology and chemistry are taught libraries should have multiple copies of this important book **Index of NLM Serial Titles** National Library of

Medicine (U.S.), A keyword listing of serial titles currently received by the National Library of Medicine Fermented Beverage Production Andrew G.H. Lea, John R. Piggott, 2012-12-06 Fermented Beverage Production Second Edition is an essential resource for any company producing or selling fermented alcoholic beverages In addition it would be of value to anyone who needs a contemporary introduction to the science and technology of alcoholic beverages This authoritative volume provides an up to date practical overview of fermented beverage production focusing on concepts and processes pertinent to all fermented alcoholic beverages as well as those specific to a variety of individual beverages The second edition features three new chapters on sparkling wines rums and Latin American beverages such as tequila as well as thorough updating of information on new technologies and current scientific references **Fermentations and Food Science** H. T. Huang, 2000 **Food Microbiology** Addison Solis, 2018-06-16 Food microbiology is a branch of applied microbiology and the scope of food microbiology is expanding rapidly to protect food from microbial spoilage and provide safe nutritious food to consumers We now live in a period of world wide food crisis a food saved is a food produced Food Microbiology explores the fundamental elements affecting the presence activity and control of microorganisms in food The subject also includes the key concepts required to meet the minimum standards for degrees in food science with a wealth of practical information about the most essential factors and principles that affect microorganisms in food Food microbiology is mainly concern with production of food beverages cheese yogurt tempeh kimchi beer and wine etc with the use of microbes As most people are aware microbes can also cause food spoilage This area of food microbiology is of major economic importance Microbiology is the science which includes the study of the occurrence and significance of bacteria fungi protozoa and algae which are the beginning and ending of intricate food chains upon which all life depends These food chains begin wherever photosynthetic organisms can trap light energy and use it to synthesize large molecules from carbon dioxide water and mineral salts forming the proteins fats and carbohydrates which all other living creatures use for food Within and on the bodies of all living creatures as well as in soil and water micro organisms build up and change molecules extracting energy and growth substances Today food microbiology has become an interesting and challenging subject The present book covers important main aspects of interaction between microorganisms food borne illnesses and food fermentations The Oxford Handbook of Food Fermentations Charles W. Bamforth, Robert Edwin Ward, 2014 Fermentation as a chemical and biological process is everywhere Countless societies throughout history have used it to form a vast array of foods and drinks many of which were integral and essential to those cultures it could be argued that the production of beer and bread formed the basis of many agriculture based civilizations Today nearly every person on the planet consumes fermented products from beer and wine to bread and dairy products to certain types of meat and fish Fermentation is a nearly ubiquitous process in today s food science and an aspect of chemistry truly worth understanding more fully In The Oxford Handbook of Food Fermentations Charles W Bamforth and Robert E Ward have collected and edited contributions from many of the world s

experts on food fermentation each focused on a different fermentation product The volume contains authoritative accounts on fermented beverages distilled beverages and a diverse set of foods as well as chapters on relevant biotechnology Each chapter embraces the nature of the product its production and its final composition The text also touches on the raw materials and processes involved in producing packaged foodstuff and the likely future trends in each area In the conclusion Bamforth and Ward present a comparison between the various products and the diverse technologies employed to produce them Fermentation is a multifaceted process that affects a wide variety of products we consume and The Oxford Handbook of Food Fermentations is the definitive resource that captures the science behind fermentation as well as its diverse applications

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