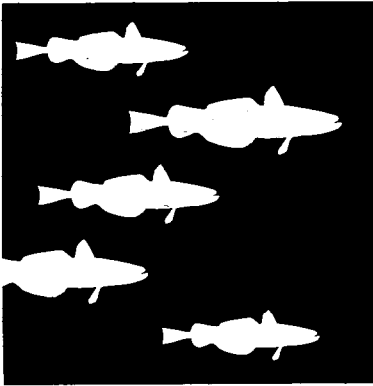


PACIFIC WHITING

Harvesting, Processing,

Marketing, and

Quality Assurance



A Workshop:

March 30-31, 1992

Newport, Oregon

Edited by Gilbert Sylvia

and

Michael T. Morrissey

LOAN COPY ONLY

CIRCULATING COPY
Sea Grant Depository



LOAN COPY ONLY

PACIFIC WHITING

Harvesting, Processing, Marketing, and Quality Assurance

Edited by Gilbert Sylvia
and
Michael T. Morrissey



Oregon Sea Grant
Corvallis, Oregon

Oregon Sea Grant, Corvallis, Oregon State University,
Administrative Services A402, Corvallis, Oregon 97331-2134

© 1992 by Oregon State University. All rights reserved.

\$ 10.00

ISBN 1-881826-07-4

CONTENTS

support v

Preface vi

Acknowledgments vii

Oregon's Whiting Fishery: A Case Study in Cooperative
Development 1

Barry Fisher

SEAFOOD TECHNOLOGY

Quality Issues in the Pacific Whiting Fisheries 9

Michael T. Morrissey, Gregory Peters, and Gilbert Sylvia

Use of Various Grades of Surimi with an Application of Least
Cost Formulation 17

Jae W. **Park**

Cryoprotection of Surimi 20

Tyre C. Lanier and Grant A MacDonald

Product Alternatives for Pacific Whiting 29

**Edward Kolbe, Cheng-Kuang Hsu, Tyre C. Lanier, Grant A
MacDonald, Michael T. Morrissey, and Ricardo Simpson**

Use of Potato Inhibitor in Pacific Whiting Surimi 33

Roy W. Porter

Proteolysis of Pacific Whiting and Its Inhibition 36

Haejung An, Yun-Chin Chung, and Michael T. Morrissey

QUALITY ASSURANCE

Quality Assurance Programs for Pacific Whiting 41

Gilbert Sylvia and Lisa Gaines

Hazard Analysis and Critical Control Points for Argentine
Hake (*Merluccius hubbsi*) Processing Plants 47

Enrique Bertullo

European Quality Requirements for Hake 50

Joachim Werner

The Importance of Quality Assurance for the Introduction of
Pacific Hake into Traditional Frozen Seafood Markets 66

Jim Daniels

Panel Discussion on Quality Assurance 58

Panel Discussion on the Cooperative Efforts of Fishermen and
Processors to Improve Product Quality of Pacific Whiting 60

MARKETING

Surimi Market-Boom or Bust 65

Ron Jensen

Global Markets for Surimi-based Products 67

Joseph Zalke

The Situation of Global Surimi, with Special Emphasis on the Japanese Market 73

Ichiro Kano

Market Promotion Opportunities and Challenges for Pacific Whiting 66

Dalton Hobbs

Product Characteristics and Market Demand for Pacific Whiting 82

Gilbert Sylvia and Gregory Peters

Panel Discussion on Marketing of Pacific Whiting 87

BIOLOGY AND MANAGEMENT

How the Biology of Pacific Whiting Might Constrain the Development and Stability of the Fishery 91

Mark E. Wilkins

Potential Yield from the Pacific Whiting Fishery 96

David B. Sampson

A Multiple-Objective Bioeconomic Policy Model of the Pacific Whiting (*Merluccius productus*) Fishery 194

Roberto R. Enriquez and Gilbert Sylvia

Panel Discussion on Biology and Management of Pacific Whiting 111

Closing Remarks 112

Barry Fisher

SUPPORT

A number of agencies and individuals have supported research in Pacific whiting fisheries over the years. Among them are the following

USDA/CSRA--Special Research Grant Agreement 92-34 276-7140
Oregon State University Agriculture Experiment Station
Oregon Sea Grant
National Marine Fisheries Service
Center for Applied Agricultural Research
Oregon Trawl Commission
Oregon Department of Agriculture
Captain Barry Fisher



This book is funded by the National Oceanic and Atmospheric Administration, through Oregon Sea Grant (grant number NA89AA-D-SG108). The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its subagencies.

PUBLICATION CREDITS

Technical Editor: Sandy Ridlington
Discussion Reporter: Anne Shriver

PREFACE

The domestication of the Pacific whiting fishery has resulted in an opportunity for significant cooperation between the fishing industry and research institutions. *Merluccius productus* has a number of behavioral and intrinsic characteristics that make controlling product quality a challenging problem. These characteristics include high recruitment variability, complex migration patterns, a relatively soft flesh, a fat layer associated with rancidity, the presence of myxosporidean parasites, and high levels of protease enzymes in the muscle tissue. These characteristics affect fishing practices, methods of processing, and market decisions. A number of ongoing research projects are designed to help us understand these relationships, including how different variables, such as time and temperature, affect product quality.

When we convened this workshop, our principal idea was to present information gathered from our ongoing research efforts as well as the efforts of others in the domestic and international hake/whiting fisheries. Our hope is that this information can be used to develop profitable quality-assurance programs and improve market opportunities. We were delighted with the response to the workshop in both at-

tendance and active participation of the audience during the discussions and question and answer periods. The workshop proved to be a two-way street, with considerable give and take between industry and researchers. Our hope is that this interaction will continue as product quality and market-related issues arise over the next several years.

The workshop was designed to cover a wide range of important topics in the Pacific whiting fisheries, including food technology, product quality, marketing, biology, and fisheries policy. As part of the newly formed Coastal Oregon Marine Experiment Station (COMES) at Oregon State University, we feel that this comprehensive approach to fisheries issues fits perfectly with the mission of the COMES program, which recognizes the need for interdisciplinary research in order to optimally manage the fishery resources.

Gilbert Sylvia
Hatfield Marine Science Center
Newport, Oregon

Michael T. Morrissey
OSU Seafood Laboratory
Astoria, Oregon

ACKNOWLEDGMENTS

We wish to acknowledge the many private companies, public agencies, and individuals that contributed to the success of this workshop. We thank the Depoe Bay Fish Company, Newport Shrimp Company, Ocean Foods of Astoria, **Pacific** Coast Seafoods, Point Adams Packing Company, and Oregon Trawl Commission for their generous financial sponsorship. We would especially like to thank the other members of the organizational committee for their efforts, including Barry Fisher (**Midwater** Trawler's Association), Joe Easley (Oregon **Trawl** Commission), Jay Rasmussen (Oregon Coastal Zone Management Association), Hans **Radtke** (Resource Economist), Jerry Bates (Depoe Bay Fish Company), and Grant Larson (Ocean Foods of Astoria). Susan Mills and

Maureen Collson (Coastal Oregon Marine Experiment Station) and Georgia York (Oregon Coastal Zone Management Association) deserve special thanks for their yeomanly work in organizing the conference and attending to the 1001 administrative details. Sandy **Ridlington** (Oregon Sea Grant) edited the proceedings and oversaw their publication. Anne Shriver (International Institute of Fisheries Economics and Trade) summarized the discussions and the question and answer sessions. We also thank Bob Malouf and Sea Grant for publishing these proceedings. Finally, we would like to thank **Lavern** Weber (Superintendent, Coastal Oregon Marine Experiment Station) for his support of and commitment to all of the research devoted **to this effort** and to addressing issues related to the Pacific whiting