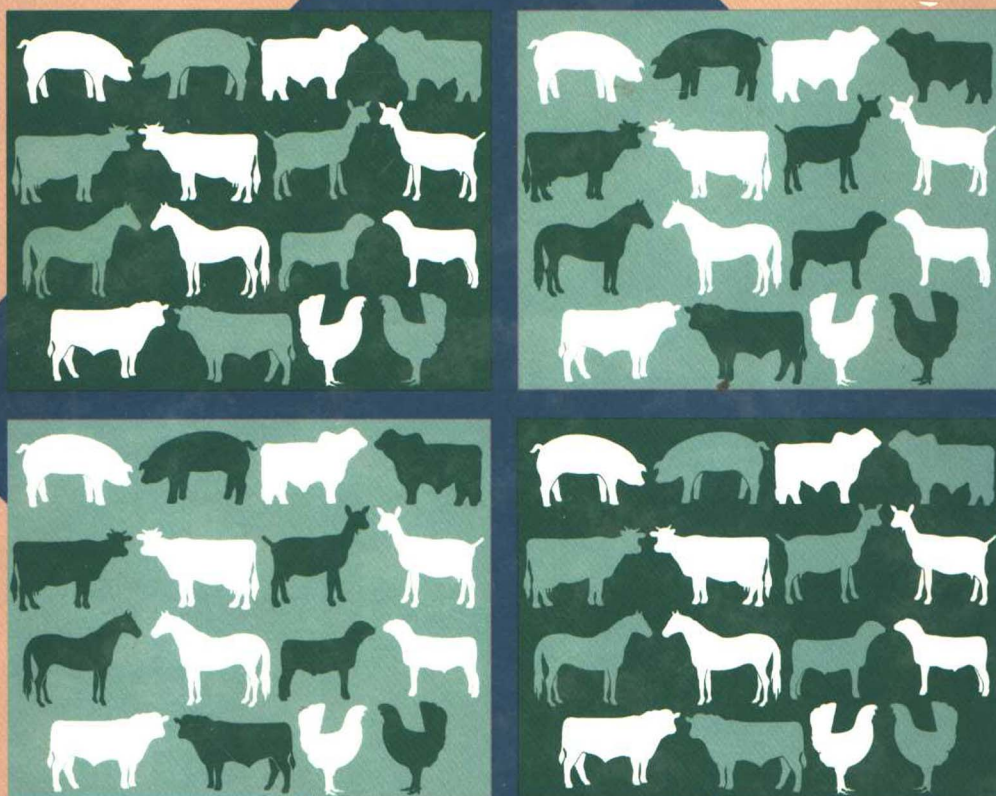


Fifth Edition

SCIENTIFIC FARM ANIMAL PRODUCTION

An Introduction to Animal Science



Robert E. Taylor



FIFTH EDITION
Scientific Farm
Animal Production

AN INTRODUCTION TO
ANIMAL SCIENCE

ROBERT E. TAYLOR

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Dedication

This book is dedicated to the hundreds of students the author has taught. The positive and rewarding interactions with these students have provided the stimulus to write this book. Hopefully, the reading and studying of *Scientific Farm Animal Production* will be a motivational influence to current and future students as they seek to enhance their education.



Preface

Scientific Farm Animal Production is distinguished by an appropriate combination of both breadth and depth of livestock and poultry production and their respective industries. The book gives an overview of the biological principles applicable to the Animal Sciences with chapters on reproduction, genetics, nutrition, lactation, consumer products, and others. The book also covers the breeding, feeding and management of beef cattle, dairy cattle, horses, sheep, swine, poultry, and goats. Although books have been written on each of these separate chapters, the author has highlighted the significant biological principles, scientific relationships, and management practices in a condensed but informative manner.

Target Audience

This book is designed as a text for the introductory Animal Science course typically taught at universities and junior or community colleges. It is also a valuable reference book for livestock producers, vocational agriculture instructors, and others desiring an overview of livestock production principles and management. The book is basic and sufficiently simple for urban students with limited livestock experience, yet challenging for students who have a livestock production background.

Key Features

Chapters 1–9 cover animal products and give an overview of the livestock and poultry industries, Chapters 10–21 discuss the biological principles while livestock and poultry management practices are presented in Chapters 22–33.

The glossary of the terms used throughout the book has been expanded so students can readily become familiar with animal science terminology. The bold-lettered words in the text are included in the glossary.

Many illustrations in the form of photographs and line drawings are used throughout the book to communicate key points and major relationships. If “a picture is worth a thousand words,” the numerous photographs and drawings expand the usefulness of the book beyond its pages.

Selected references are provided for each chapter to direct students into greater depth and breadth as they become intrigued with certain topics. Instructors can also use the references to expand their knowledge in current background material. Also included in the selected-references section are references to visuals that relate to the specific chapter. Instructors are encouraged to review these visuals and use those which will enrich their course.

Using The Book

The book is designed to accommodate several instructional approaches to teaching the introductory course: (1) the life-cycle biological principles approach, including such areas as consumer products, reproduction, breeding, nutrition, and animal health; (2) the species approach (teaching the course primarily in reference to the various species); or (3) a combination of the previous two. The latter appears to be the most popular teaching approach, covering principles in lecture and combining principles and species into laboratory exercises.

It is recommended that if study questions are utilized, instructors develop the questions for each chapter or group of chapters that best fits their areas of emphasis. Some instructors will assign one or more papers on a topic selected by them or the students. The references at the end of each chapter are designed for students who want or need to explore certain topics in more depth.

Most instructors will not have sufficient time in their course to assign all the chapters. Course outlines can be developed to include the chapters assigned and put them in the sequence that meets their preference.

Changes In This Edition

This edition has been updated with current technical and applied information. The section on biotechnology has been expanded in Chapter 12, genetics. The chapter on animal welfare and animal rights (Chapter 35, Issues in the Animal Industries) has been updated to include an increased number of current issues. Students should understand the issues in animal agriculture because many of them will be involved in finding solutions to these issues.

The management emphasis, where bioeconomics focuses on combining biology with economics, is expanded. The global dimensions of the animal industries are also emphasized.

Acknowledgments

Appreciation is expressed to those individuals and organizations who have reviewed all or part of the fourth and fifth editions and offered suggestions for the revision. The following individuals and organizations made a major contribution to the fifth edition: Doug Butler (Colorado State University), Steve Dam-

ron (Oklahoma State University), James Foster (Purdue University), George F. W. Haenlein (University of Delaware), Brad Gillmore (Colorado State University), Boyd Ramsey (Texas Tech University), Chris Skaggs (Texas A & M University), Gary Smith and AN560 students (Colorado State University), Bill Wailes (Colorado State University), F. W. Williams, Jr. (USDA). A special thanks to Barbara Holst and Pat Beebe who typed the fifth edition.

Many instructors who teach the introductory animal science course completed a questionnaire and made numerous helpful suggestions. Those individuals who offered helpful comments that were incorporated into the fifth edition are:

T. D. Bedner, Louisiana State University
Edd Clemens, University of Nebraska
Russ Danielson, North Dakota State University
James Foster, Purdue University
Tom Field, Colorado State University
Eldan Heathcott, Murray State University
Tony Mallilo, University of Rhode Island
Tim Marshall, University of Florida
Scott Martin, University of Georgia
F. B. Masincupp, University of Tennessee
Lyle G. McNeal, Utah State University
H. W. Miller, Mississippi State University
Dave Nichols, Kansas State University
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Tim Ross, New Mexico State University
Stephen Schmidt, Auburn University
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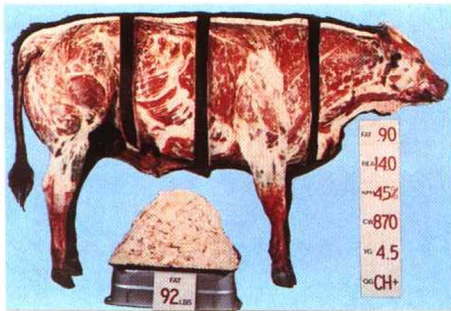
About The Author

Dr. Taylor was raised on an Idaho livestock operation where several livestock species were produced. He received B.S. and M.S. degrees from Utah State University. This background, combined with his Ph.D. work in animal breeding and physiology from Oklahoma State University, has provided much depth to his knowledge of livestock production. He has had practical production experience with beef cattle, dairy cattle, horses, poultry, sheep, and swine.

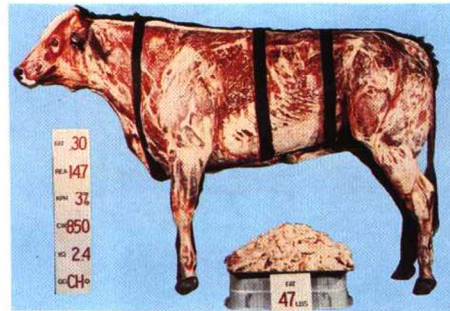
Dr. Taylor received teaching awards at Iowa State University (where he also managed a swine herd) and at Colorado State University. He also received the Distinguished Teaching Award from the American Society of Animal Science in recognition of his ability to organize and present materials to students. Many of his concepts for effective teaching are used in this book.



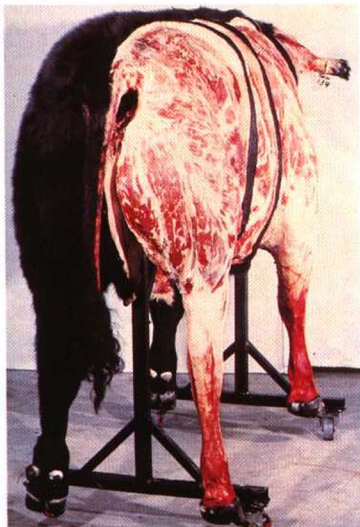
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PLATE A.
Courtesy of Colorado State University.

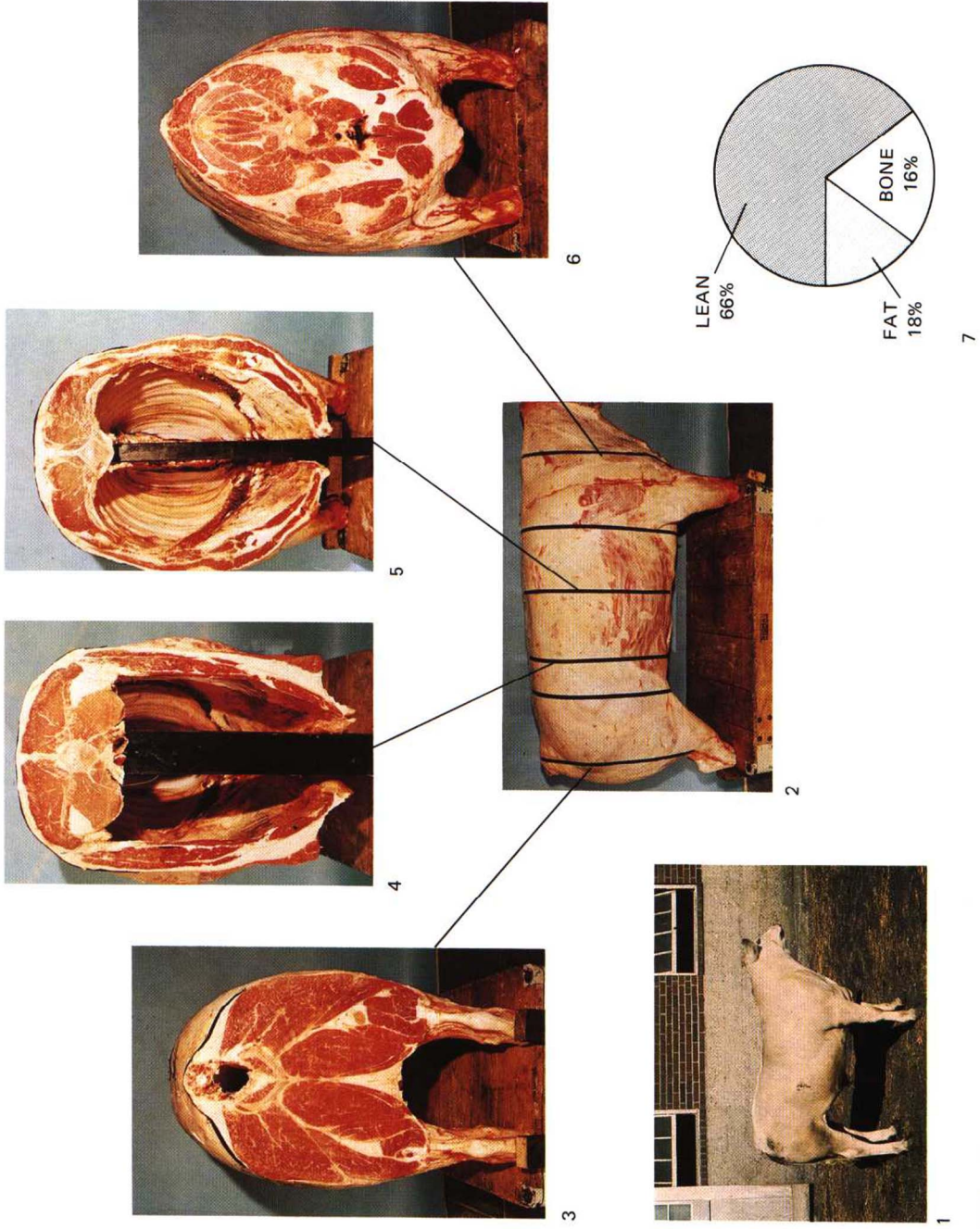


PLATE B.
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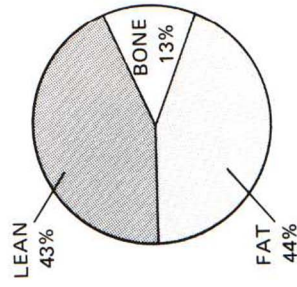
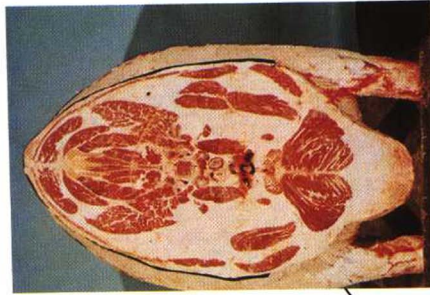
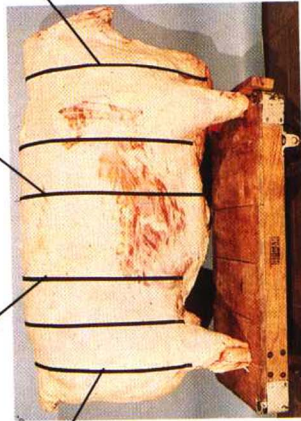
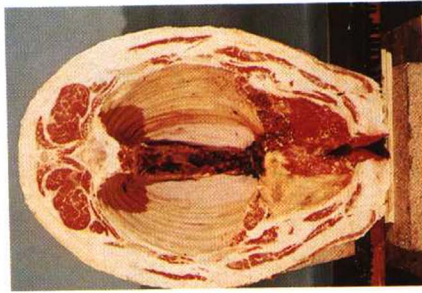
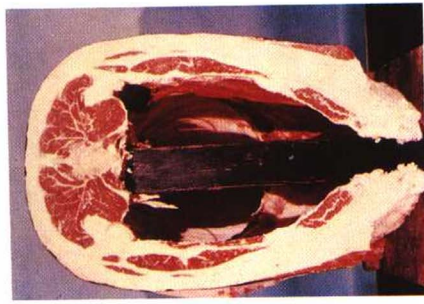
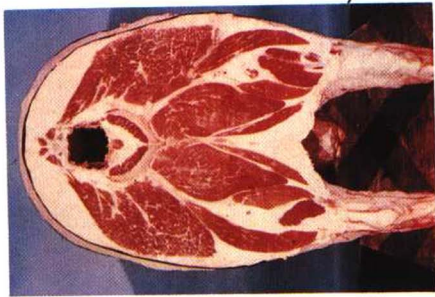


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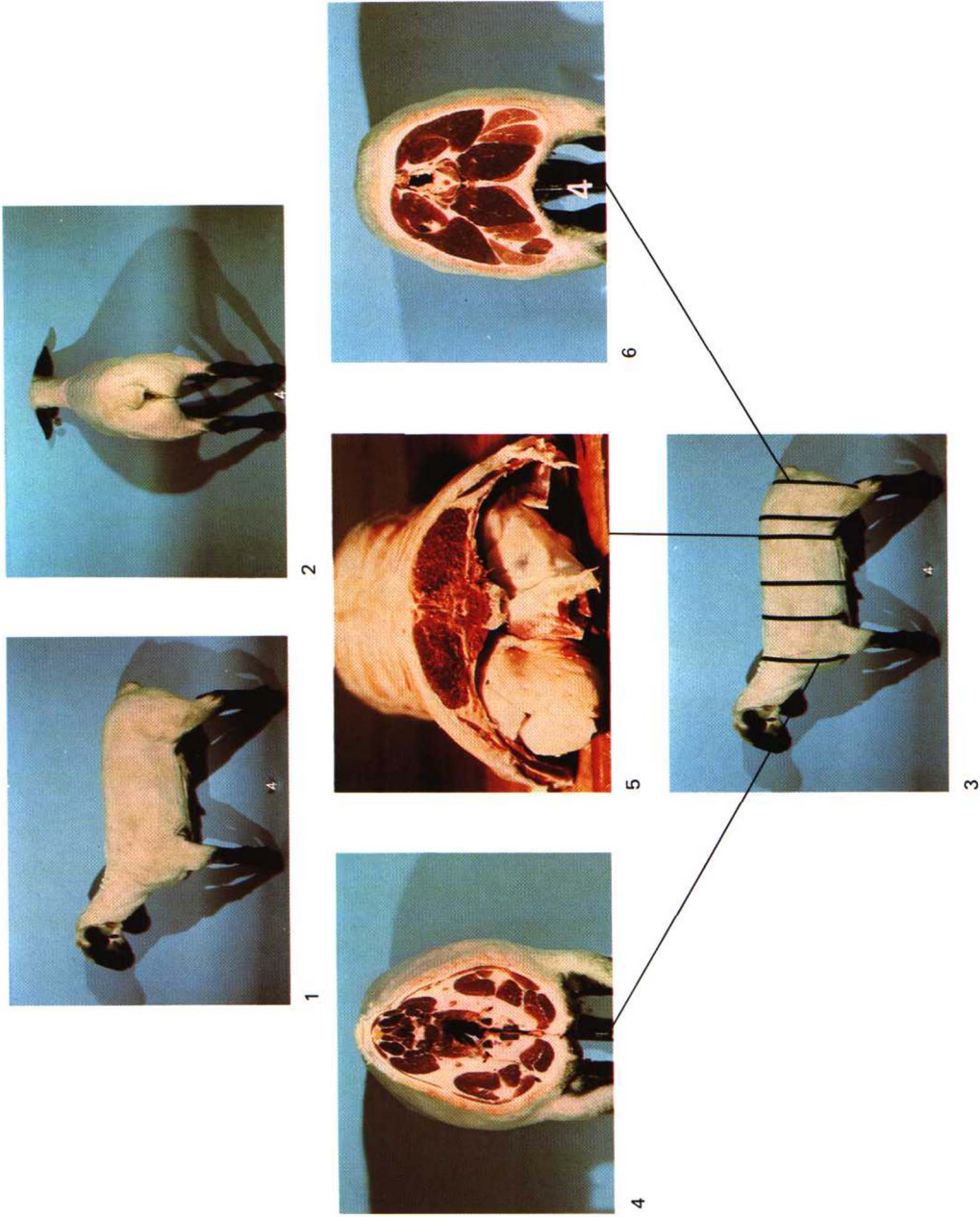
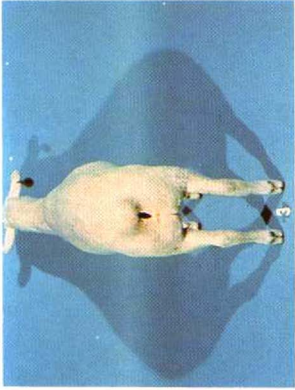
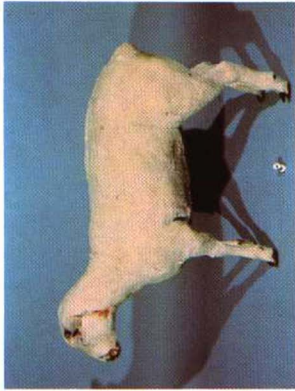
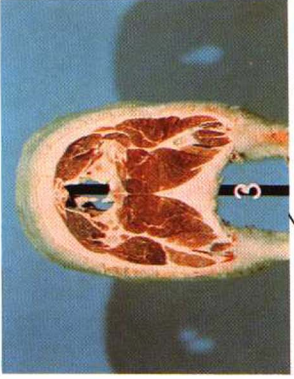
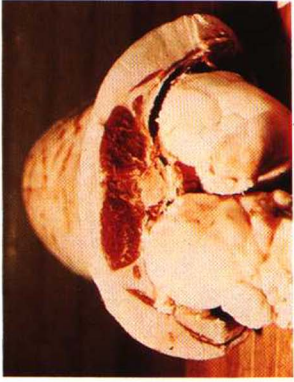


PLATE D.
Courtesy of Iowa State University.



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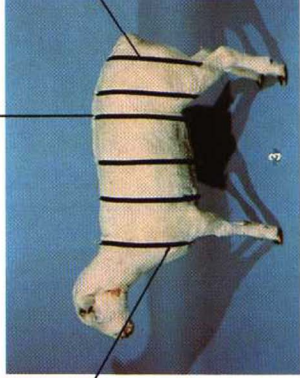
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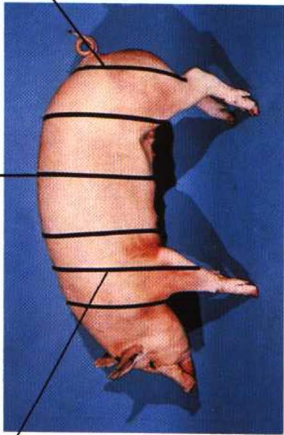
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Courtesy of Iowa State University.



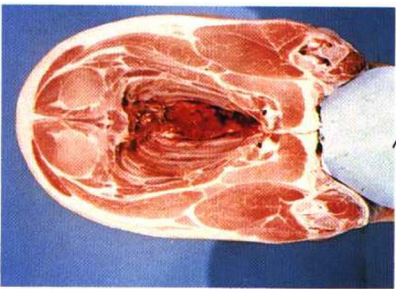
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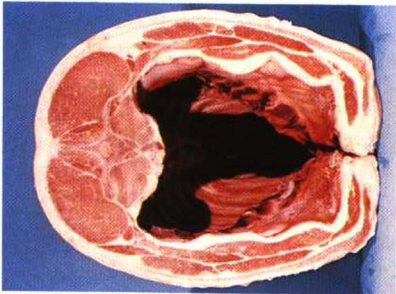
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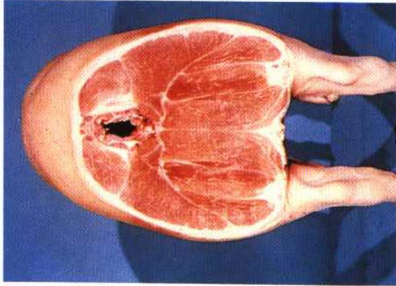
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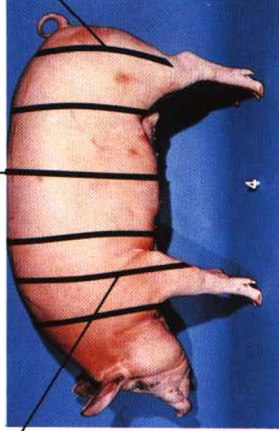
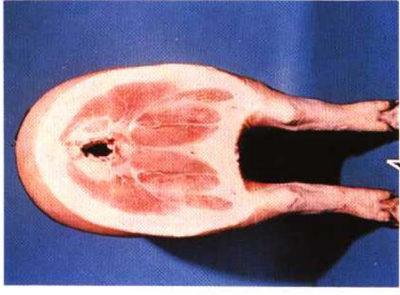
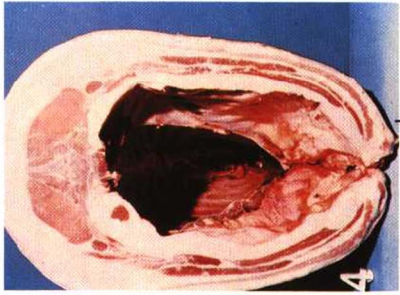
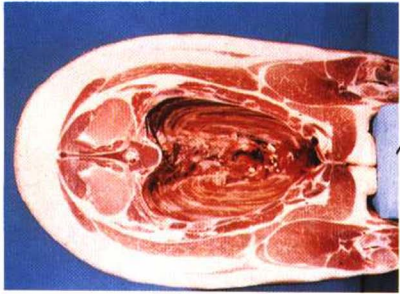
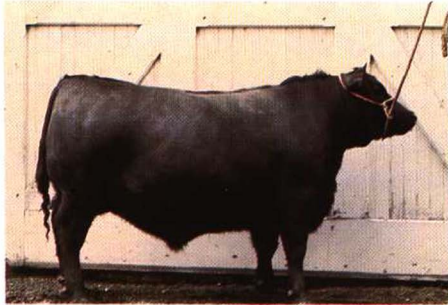
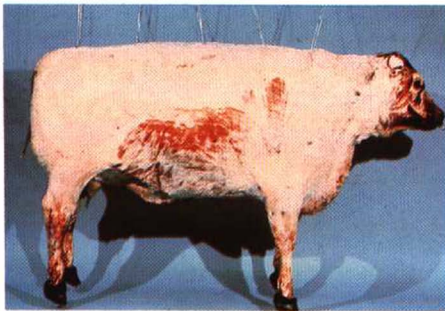


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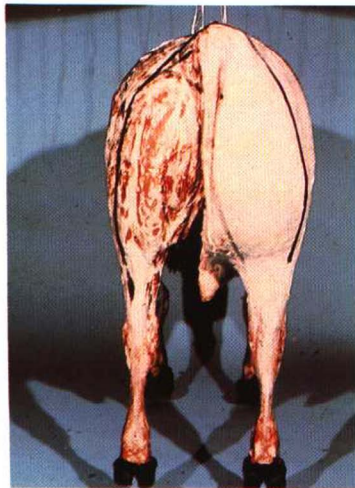
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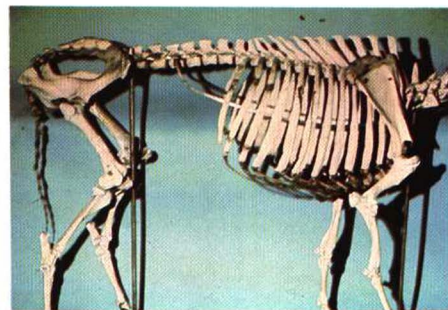
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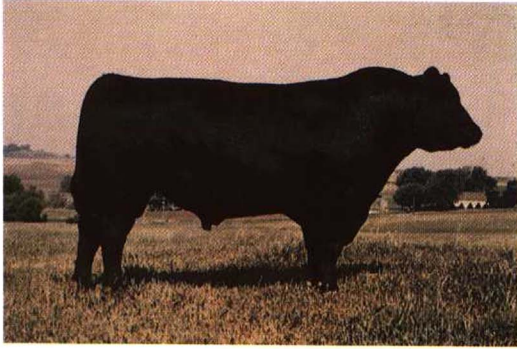


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PLATE H.
Courtesy of Iowa State University.



Angus



Beefmaster



Brahman



Brangus



Charolais



Chianina

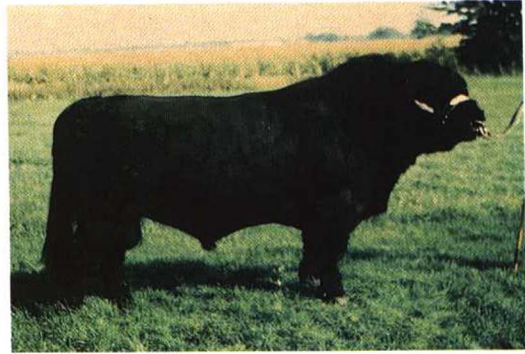
PLATE I.

PLATES I-L.

Some of the breeds of cattle used for beef production in the United States. Courtesy of the American Angus Association, BBU, American Brahman Breeders Association, International Brangus Breeders Association, Charolais Journal, American Breeders Service, North American Gelbvieh Association, North American Limousin Foundation, American Polled Hereford Association, Dickinson Ranch, Santa Gertrudis Breeders International, Leachman Cattle Co., American Scotch Highland Breeders Association, American Shorthorn Association, and American Simmental Association.



Devon



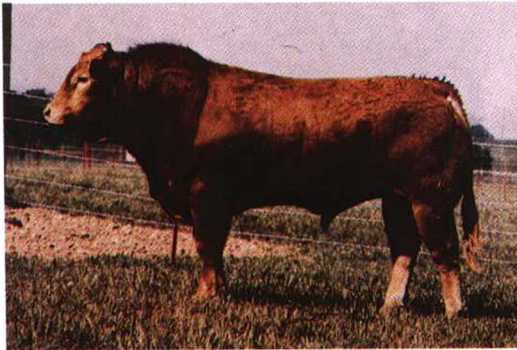
Galloway



Gelbvieh



Hereford



Limousin



Longhorn

PLATE J.