BARLEY FOR FOOD AND HEALTH

Science, Technology, and Products

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BARLEY FOR FOOD
AND HEALTH
On a Seed

“This was the goal of the leaf
and the root,
for this did the blossom burn
its hour.
This little grain is the
ultimate fruit,
This is the awesome vessel of
power.

For this is the source of the
root and the bud.
World unto world
remolded.
This is the seed, compact of
GOD,
Wherein all mystery is
unfolded.”

G. S. Galbraith
This book is dedicated to the memory of Professor Robert F. Eslick, scientist, teacher, mentor, and friend. Professor Eslick was better known as Bob or “Barley Bob” because of his dedication and love of barley. Bob joined the Plant and Soil Science Department at Montana State University in 1946, retiring as Professor Emeritus in 1983. There have been a number of very special people that we have come to know either personally or through their work with barley, but Bob was elite in an elite group. Bob was a great leader, although he was extremely modest about his work and accomplishments. His influence on the barley industry was of an importance and magnitude that continues to this day. He was recognized among plant scientists for his studies on the genetics of barley, contributing especially to the development of new genetic combinations of hulless barley lines with high levels of soluble dietary fiber and β-glucans. He was also a pioneer investigator in barley genetics related to virus disease control, malting barley variety development, feed barley quality, and numerous environmental factors, such as drought, that affect barley production. His contributions were not limited to North American barley, but extended to all continents where barley is grown. Bob’s most lasting influence on the barley industry is through his former students, who continue to breed better barleys. Bob was extremely confident that through genetics, improving barley quality was limited only to knowledge of the barley genome and the inspiration of the scientist. I shall always remember his admonition to food and nutrition scientists: “Tell me what you want in a kernel of barley and I will make it be so.”
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This book is about the use and potential of barley in food products. As nutritionists, we have often been questioned about our passion for barley food, in that other cereals are produced in abundance, are well accepted as foodstuffs, and provide many of the same essential nutrients as barley. Barley has so much to offer as a source of nutrients and potential nutraceuticals, and as a flavor and texture ingredient products. Information presented in this book will hopefully encourage greater use of barley by commercial food processing companies to produce nutritionally sound and truly health-promoting food products for consumers. We hope to increase the awareness of professionals and students of food science and nutrition of the extensive research that has been reported on barley foods.

The relationship of man and barley goes back to pre-biblical literature. In the histories of most of the early civilizations that cultivated barley, there were almost always references relating to health and well being aspects such as increased stamina, strength, and healing as well as religious and spiritual values attached to this grain. Barley, along with Einkorn and Emmer wheat, flax, and legumes such as lentils, peas, and chickpeas evolved from wild plants, and became domesticated crops purposely selected and used for human sustenance. Domestication and subsequent cultivation of barley and other crops for food were essential elements in the success of human survival and growth. Archaeological evidence indicates that barley kernels grown in ancient times are not too different from modern day barley, exhibiting common features such as hulled and hulless two-rowed and six-rowed barley.

In the chapter on barley taxonomy, morphology, and anatomy we present the similarities of barley with other cereals while illustrating the unique features of the plant. In the following chapters we discuss current progress in barley breeding and the development of transgenic barley, the major genes in the barley genome that influence nutrient composition, processing and product composition. Genetically imposed influences on barley grain composition have a profound influence on product development and nutritional efficacy of the products. Reported food science research provides practical information for new product development using barley, what has been tested, and what will and what won’t work. The chapter on health benefits of barley reviews evidence-based data in relevant health and wellness areas. This chapter is perhaps the real “meat” of the book, showing how the unique components of the barley kernel can have profound beneficial effects on the health and well being of consumers.