Connecting in the Global Marketplace

Trends in Barley Foods in the U.S.

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Background of the Heart Health Claim

- *National Barley Foods Council* submitted a petition to FDA based on the experiment of human clinical study conducted for over 6 years.
  - 10 Participants were fed food containing 1) whole wheat or brown rice, 2) **60g** of barley or 3) **120g** of barley for 5 weeks.
  - Blood samples were collected and tested for blood lipid and cholesterol level.
  - Total and LDL cholesterol were reduced as a result of barley consumption.
- Petition was finalized and approved in 2006.

Heart Health Claim: 21 CFR 101.81

- Sample Claim
  - "Soluble fiber from foods such as (name of food), as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease. A serving of (name) supplies (x) g of the soluble fiber necessary per day to have this effect".
    - There are requirements to use the claim…

Requirements of the Claim

1. Food must supply 3g/day or 0.75g/serving of β-glucan.
2. Barley must contain a certain percentage of β-glucan depending on the processing method (Shown in next slide).
3. Food has to be **low in fat, saturated fat, cholesterol** and **sodium** to use the claim.

Restriction of Heart Health Claim

- Raw material requirement

Raw materials	Processes	Min. β-glucan
Whole grain Barley	Hulless, dehulled	>4%
Dry milled Barley	Meal, grits, flour, pearled and flakes	>4%
Extracts	Barliv	>70%

Health Benefits of Barley

- Effect on lowering cholesterol and blood lipid.
  - β-glucan extract and concentrated β-glucan are found to demonstrate the same effect (Smith et al, 2008).
  - Some studies disagree, requiring the further investigation.
- Decrease appetite, increase satiety (Peters et al, 2009).
  - Fiber contributes to increase in satiety

Nutritional Content of Barley

*Macro*nutrient	
Nutrient (Unit)	Value (per 100g)
Energy (Kcal)	356
Protein (g)	15.0
Carbohydrates (g)	70.30
Total Lipid (g)	3.0
Total dietary fiber (g)	15.0
Soluble fiber (g)	6.5

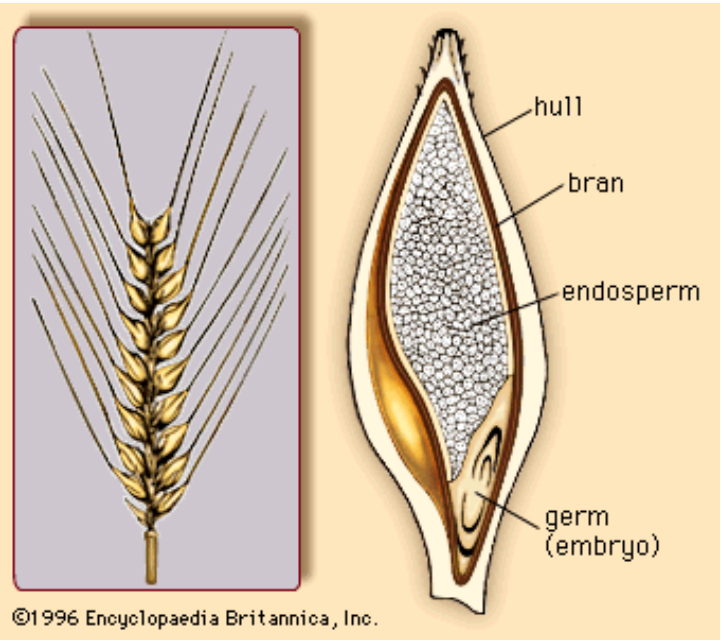
*Micro*nutrient	
Nutrient (Unit)	Value (per 100g)
Calcium (mg)	33
Iron (mg)	3.6
Magnesium (mg)	133
Phosphorus (mg)	264
Potassium (mg)	452
Manganese (mg)	1943
Selenium (mg)	37.7
Carotene, Beta (mcg)	133
Vitamin A (IU)	22

Nutritional Content of Barley

- Relatively high in
  - Vitamin A
  - Vitamin C
  - Calcium
  - Iron
  - Protein
  - Fiber
  - Natural antioxidant
- Low in
  - Fat (<3g)
  - Saturated fat (<1g)
  - Cholesterol (<20 mg)
  - Sodium (<480 mg)

β-glucan in Barley

- Higher in both total fiber and soluble fiber than oats or rye.

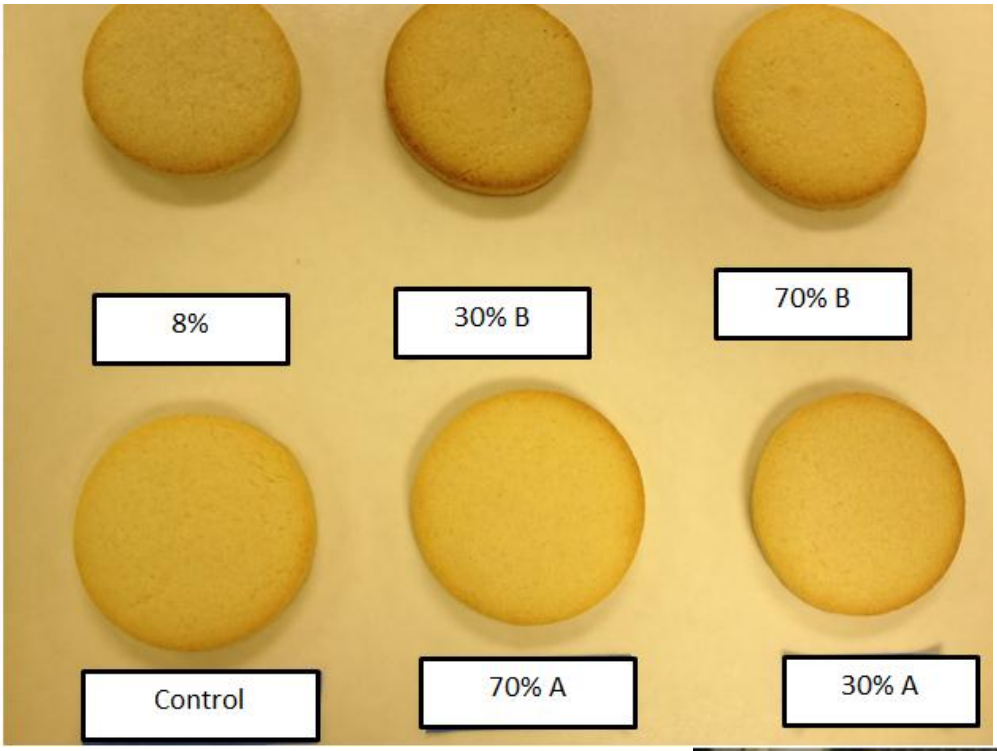


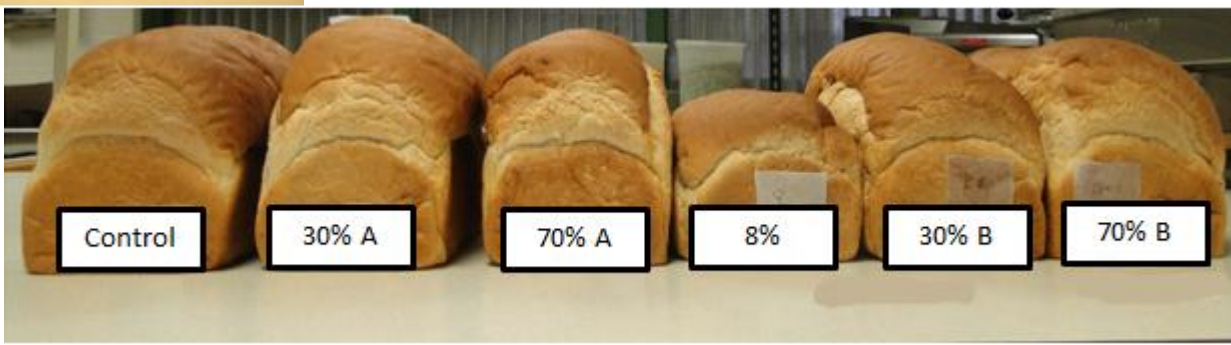
»β-glucan in barley is spread throughout the kernel so pearling process does not affect the amount of β-glucan.

Hot Topic = β-glucan Extract

- In 2008, the claim was expanded to include extracts.
- This is based on the research which demonstrated that extracts have the same effect as regular barley.
- The product approved is Barliv from Cargill
  – Concentrated β-glucan powder provides a lower viscosity, therefore can be used for beverages.
    - Does not affect the functionality of products except *water absorption*.
    - Used in supplements or drinks.

Examples of Extract Functionality





Functional Characteristics of Barley

1. Increased water absorption.
   – Fiber absorbs more water.
2. Barley flour provides higher volume.
3. Improves flavor characteristics.
4. Affect loaf volume of bread product.
   – Lower gluten property.
5. β-glucan provides higher viscosity.

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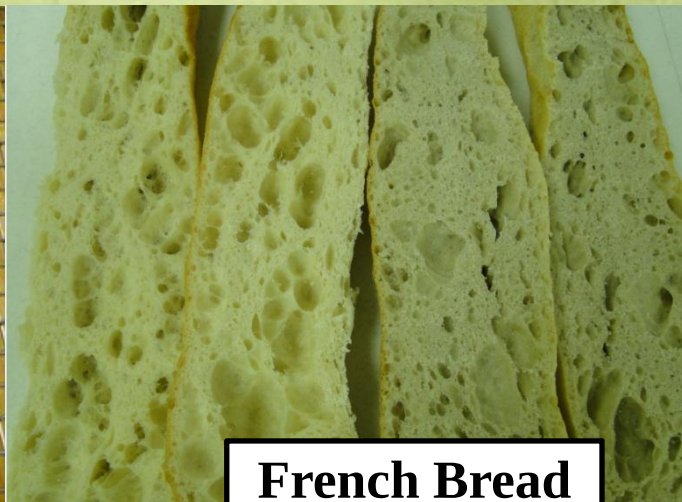
Baked Products with Hulless Barley



Progressive Promotional Activities for Food Barley Promotion

- Some progressive activities were held since initiation of food barley promotion project at NCI.
  - Conducting short term investigation on functionality of barley.
    - Product development (including processing)
    - Sensory tests
    - Analytical testing
  - Hosting seminars for domestic and international barley users for educational purposes.
  - Consulting with domestic as well as international companies.

Current Status of the Food Barley Market in the U.S.

- *Consistent supply and demand on pearled barley sector.*
  - Asian market traditionally uses pearled barley in their food and therefore they are the main consumer of the pearled barley.
  - High demand exists in soups and cereal products.
- *Hulless barley thrives to be recognized as a specialty grain.*
  - Barley is getting more attention from people with highly health conscious.
  - Promotional activities are necessary to further increase its popularity and usage

Future Perspectives of the Food Barley Market

- Barley as a functional food.
  - **Fractionation** of barley such as barley fiber, bran, protein could be possible.
- **β-glucan extracts** have a potential to be the leading products of food barley.
- Barley as a part of **whole grain** – the most realistic way.

SO WHY THE U.S. BARLEY IS SO SPECIAL?

- Advanced research and progressive varietal development effort.
- Better nutritional profile including exceptionally high fiber (soluble & insoluble) profile.
- Improved functional characteristics.
- Wide varieties on type of barley (hulled, hulless, level of β-glucan, etc..).

Any Questions?

Thank you for your time!

For further information and inquires on reference materials, please contact:

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