

What is Wheat Quality and Why It Matters

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What is Quality Wheat?

- If “You” are a farmer:
 - Grade
 - Yield
 - Disease and insect Resistance
 - Selling Price (premiums or discounts for “Quality”)

What is Quality Wheat?

- If “you” are a miller or processor:
 - Protein content
 - Flour yield (% extraction)
 - Dough strength (protein quality)
 - Baking performance
 - Pasta processing and pasta quality

Wheat Market - The Past:

- 85% of exports purchased by government entities 15 years ago.
- Grading factors established quality levels.
- Nearly all wheat sold through local elevators, grain handlers and exporting companies.

Wheat Market - The Present:

- 50% of U.S. HRS wheat is exported
- 40% of U.S. Durum is exported
- 65% of exported wheat is purchased by private milling companies/processors.
- Processors are becoming more sophisticated – increased automation
- Wheat purchased using grading and non-grading or marketing factors

Wheat Market - The Future?

- Increased market demands for specific wheat varieties, quality and performance.
- Most exported wheat purchased by individual interests.
- Hard White Spring wheat
- Organic Wheat
- Identity Preserved Wheat
- Genetically Modified/Non-GM Wheat

What Do Processors Want?

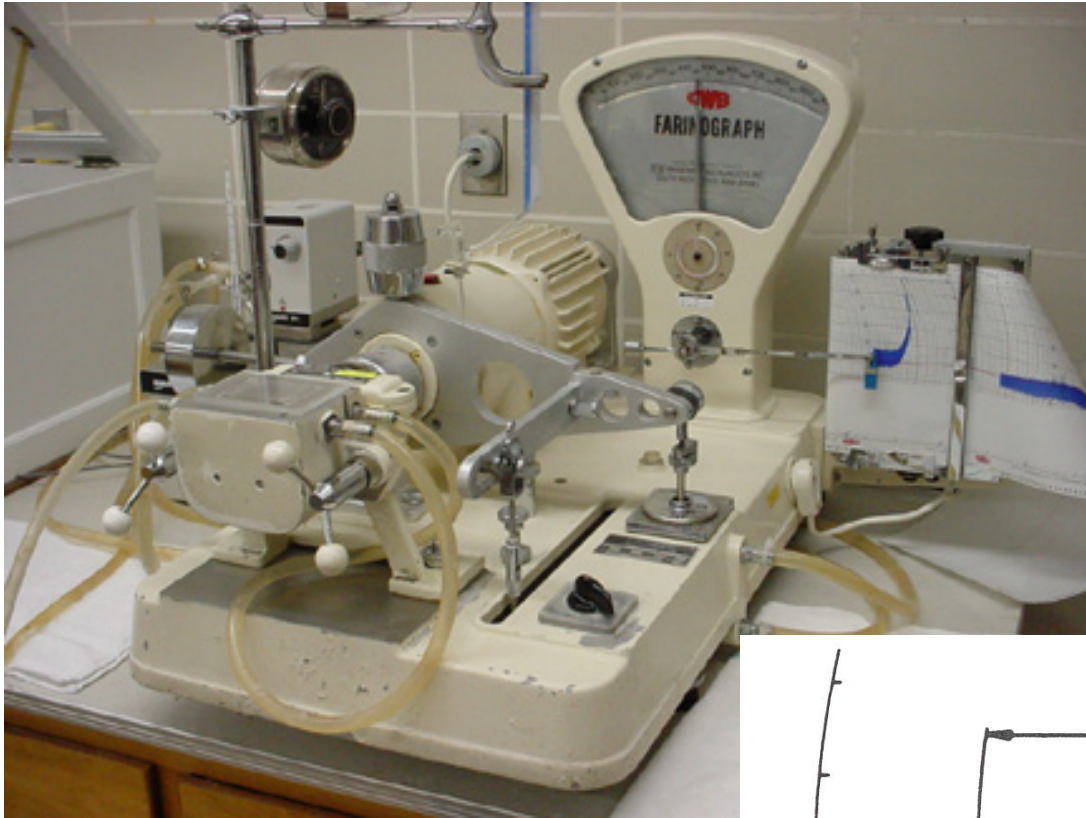
- Clean and Sound wheat
 - Less dockage and contamination
 - High Falling Number (>300 seconds)
- High protein content & quality
 - 14 to 15% protein desired in most markets
 - Excellent quality bread - desired loaf volume
 - High quality pasta
- Consistent functional quality

End-use Performance

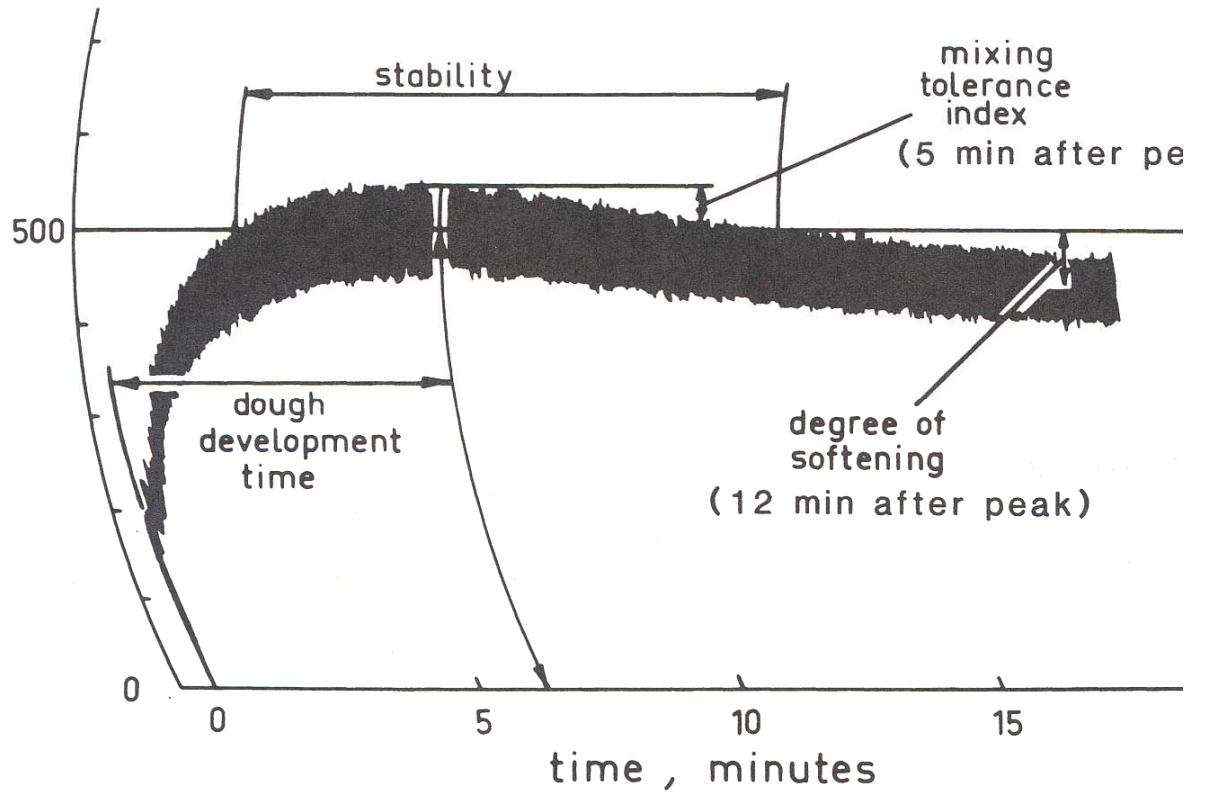
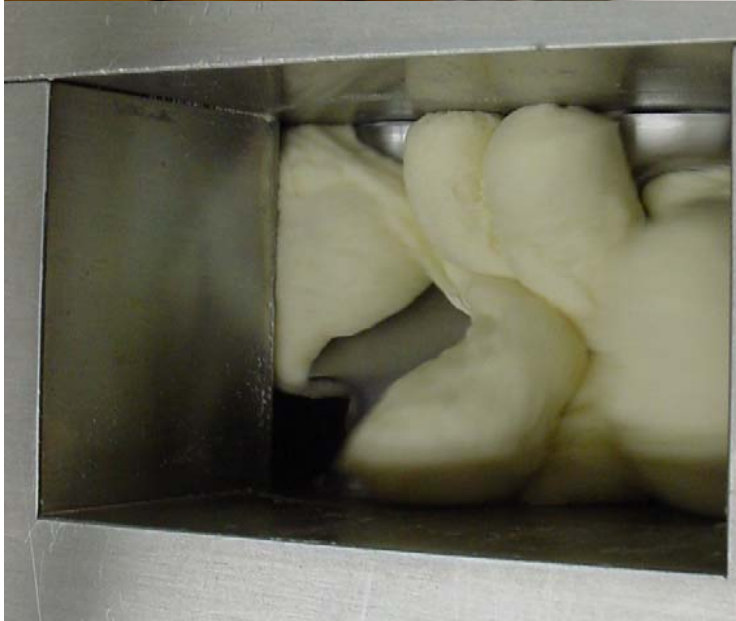
- How well the wheat performs under specific baking or processing conditions
- Often referred to as “gluten quality”, “gluten functionality” & “functional quality”
- Is the key quality parameter for millers, bakers and pasta manufacturers
- Flourmills and most large bakeries have newest testing equipment

Physical Dough Testing Instruments

- Farinograph
- Mixograph
- Extensograph
- Alveograph

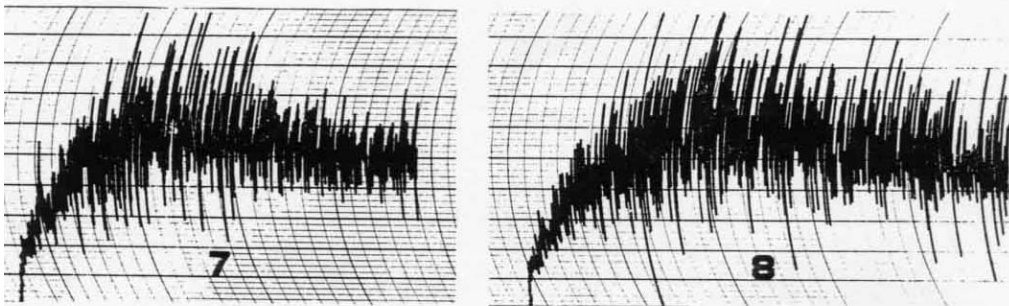
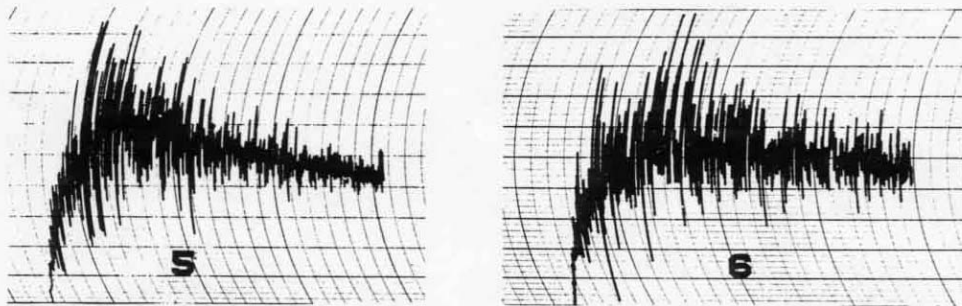
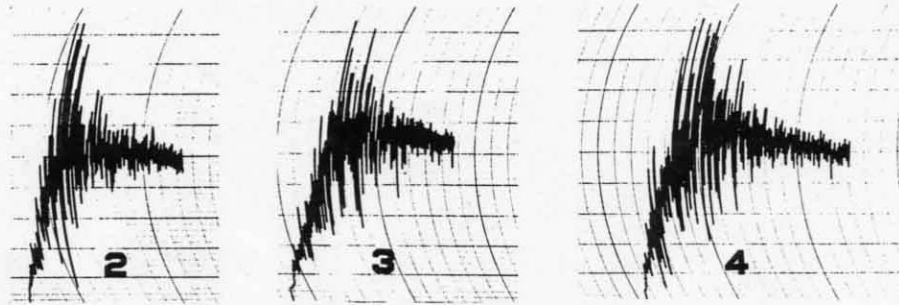


Farinograph

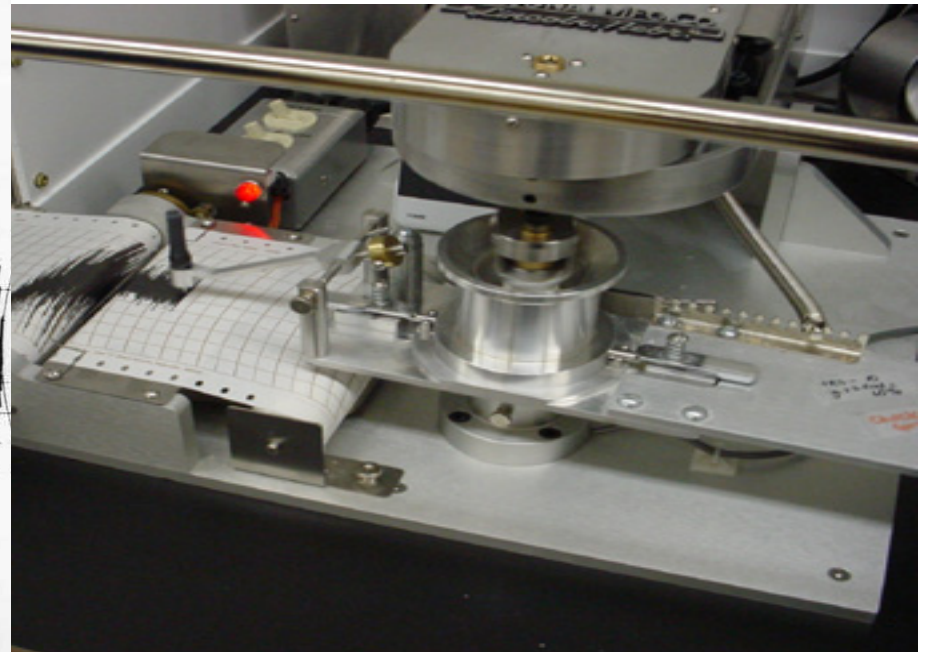
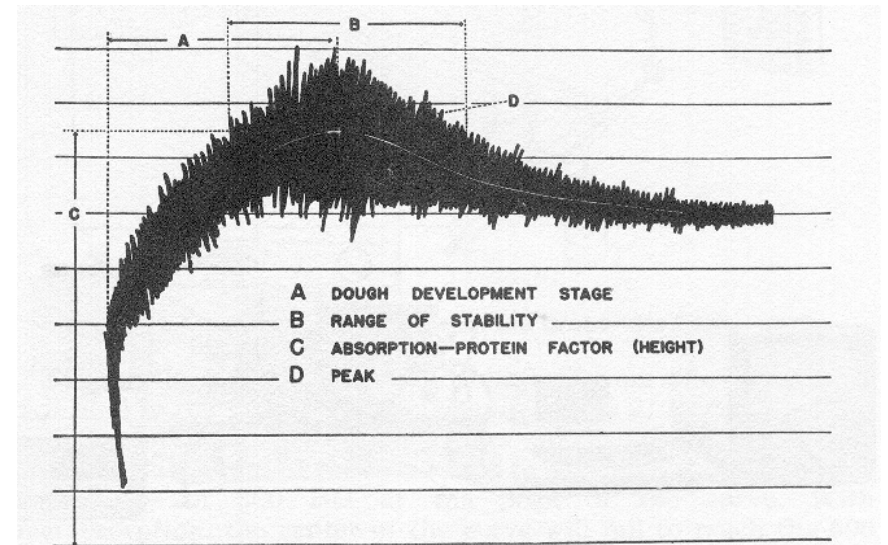


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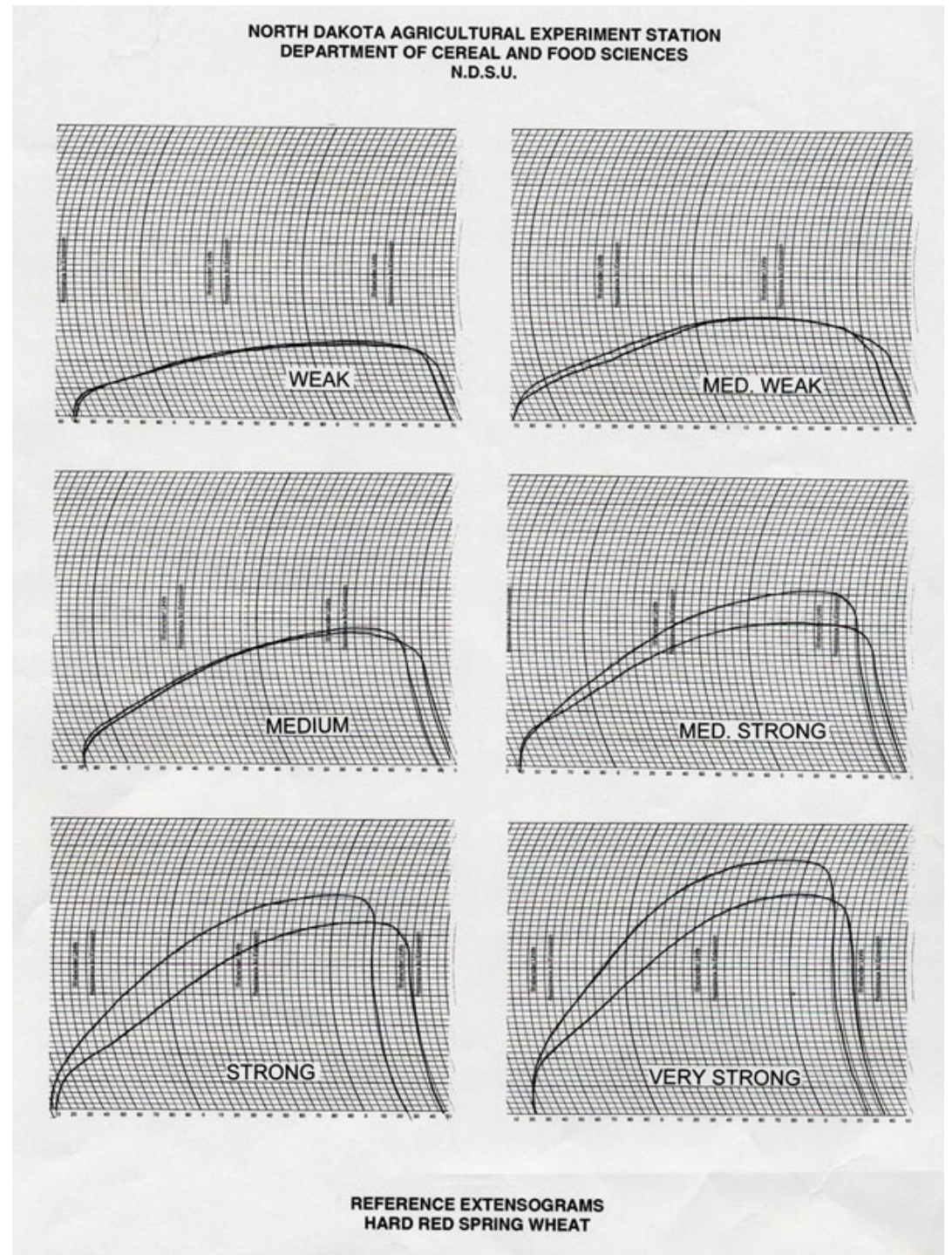
Mixograph



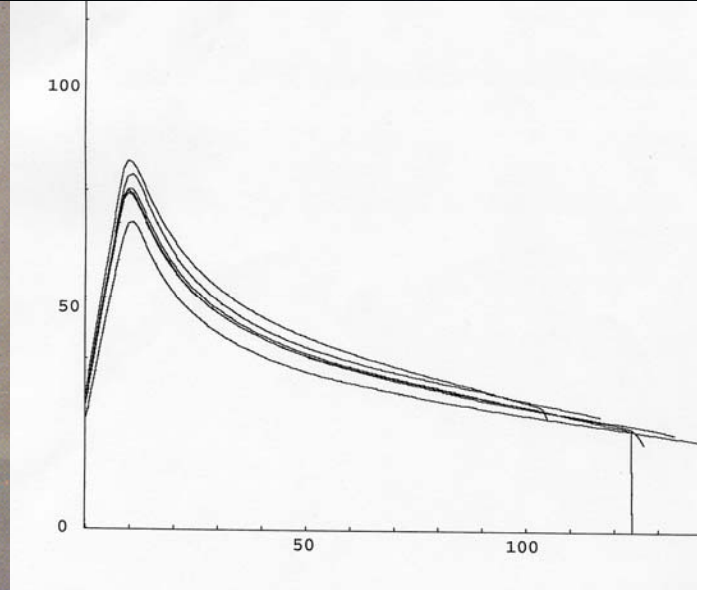
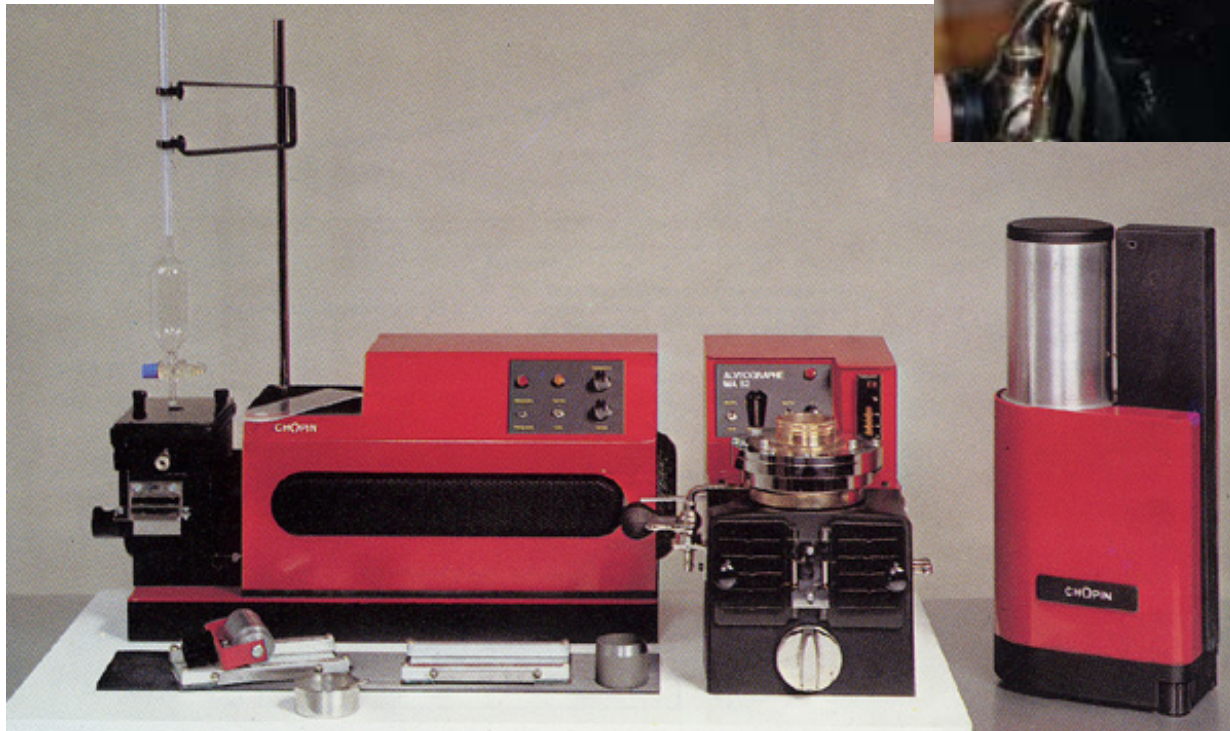
REFERENCE MIXOGRAMS
HARD RED SPRING WHEAT



Extensograph



Alveograph



Variations in End-Use Performance

- Weather: Rainfall and Temperature
 - Yearly fluctuations in rainfall and temperature
 - Timing of weather events
- Genetic potential (Varieties)
 - Varieties bred for specific areas based on expected weather conditions
 - Disease and insect pressure varies across region

End-use Performance Quality

- Inconsistent end-use quality is the biggest concern with overseas purchasers of U.S. HRS wheat and Durum
- Canadian Wheat Board provides wheat with more consistent functional quality
- Goal: Improve consistency of U.S. HRS wheat

Specifying End-use Quality

- Processors want to purchase wheat based on end-use quality specifications
 - Already taking place on a limited basis
 - Currently no “market applicable” quick test for gluten quality
- Providing specific and consistent quality will help compete against “non-traditional” export markets
 - Black Sea and Former Soviet Union countries

HRS End-Use Functionality

- Steps to better meet customer needs
 - Determine customer needs for quality
 - US Wheat Associates survey 2003
 - Current and future functionality needs
 - Develop gluten-strength test
 - Concentrate on test(s) that benefit end-users
 - USDA – FGIS: Top priority – Goal 2006
 - Work with private companies

HRS End-Use Functionality

- Steps to better meet customer needs
 - Develop HRS breeding quality targets
 - Public and private breeding groups currently engaged in drafting targets to aid breeders
 - Wheat, milling, flour and baking quality parameters
 - Develop “recommended varieties” list
 - Would help producers know what varieties are desired by processors
 - Would need to be specific to each area within the region

Keeping an Eye on Quality

- Northern U.S. Hard Red Spring and Durum wheat have good reputations for end use quality
- Protein Quality is as important as Quantity
- Not all varieties have the same end-use performance quality
- High production yield varieties often lower in protein content and gluten strength
- Talk with local elevator managers to determine demand (or lack of demand) for particular varieties

Impact of Protein Quality



Variety: Grandin



Experimental Variety
(Not Released for Production)

Note: Protein contents similar for both wheat varieties