

Quality Characteristics of U.S. Soft White and Club Wheat



**4TH ICC LATIN AMERICAN
CEREALS CONFERENCE
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USDA Federal Grain Inspection Service

Classes – there are 8 classes of U.S. wheat

Durum, Hard Red Spring, Hard Red Winter, Soft Red Winter, Hard White, **Soft White**, Unclassed, Mixed

Sub-Classes – 3 classes have sub-classes

Durum: Hard Amber Durum, Amber Durum, Durum

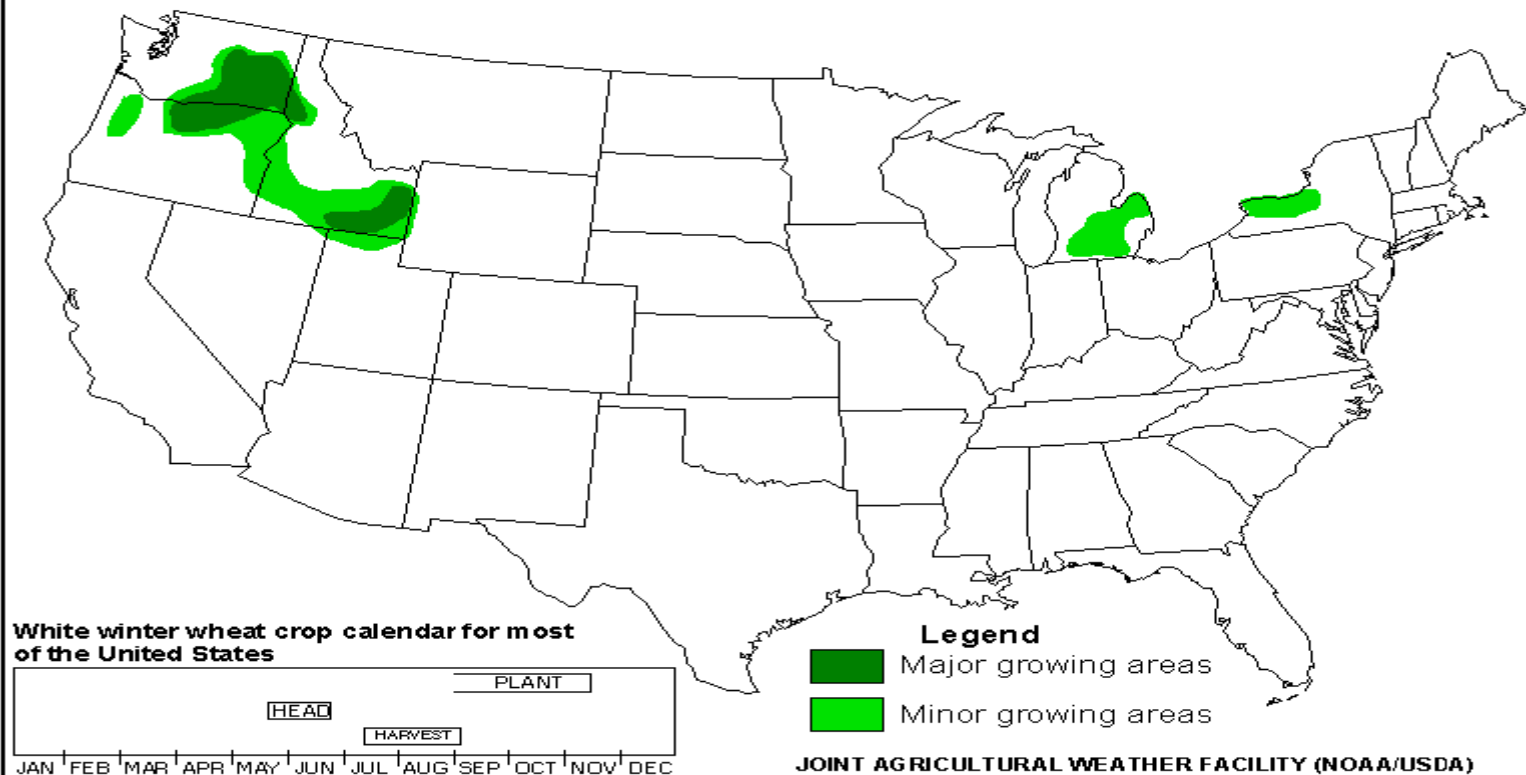
Hard Red Spring: Dark Northern Spring, Northern Spring, Red Spring

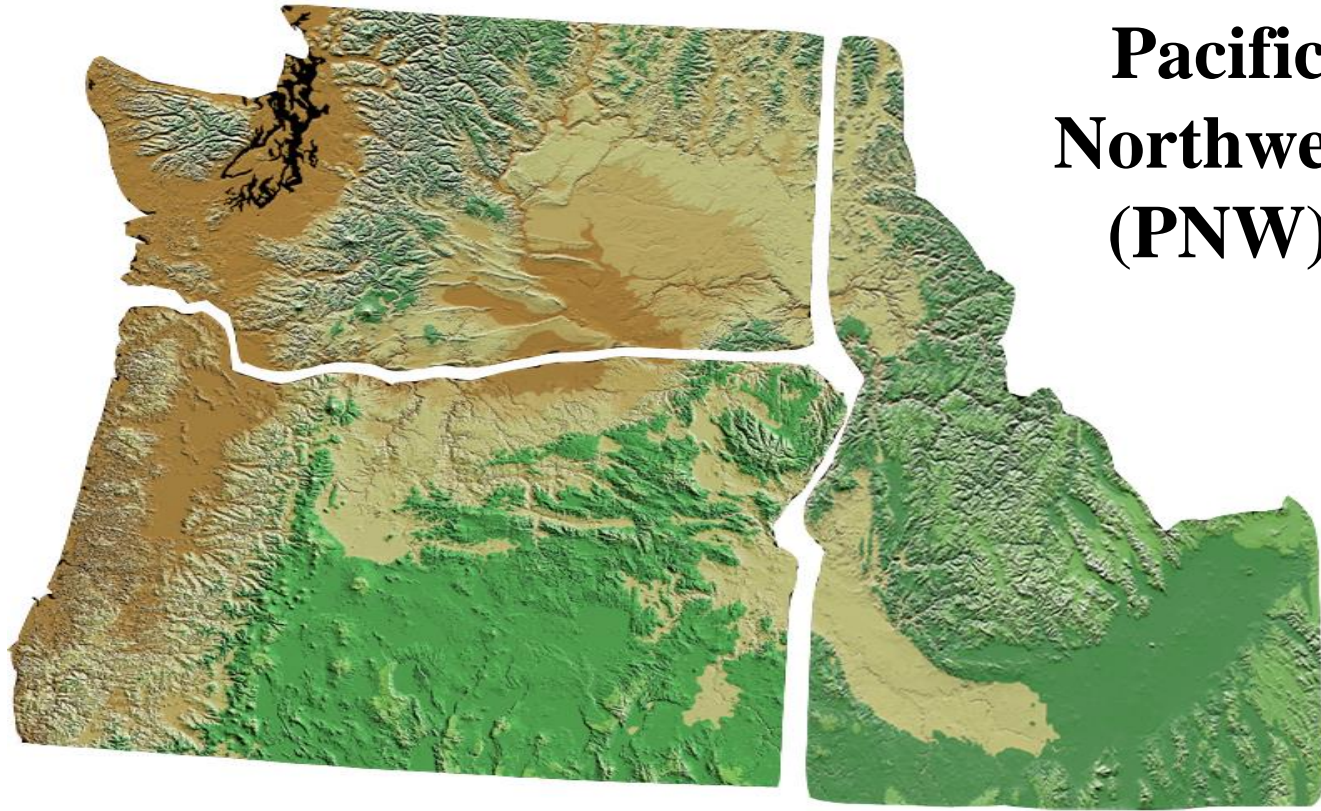
Soft White: Soft White, White Club, Western White

NB: no winter or spring separation in soft white and club

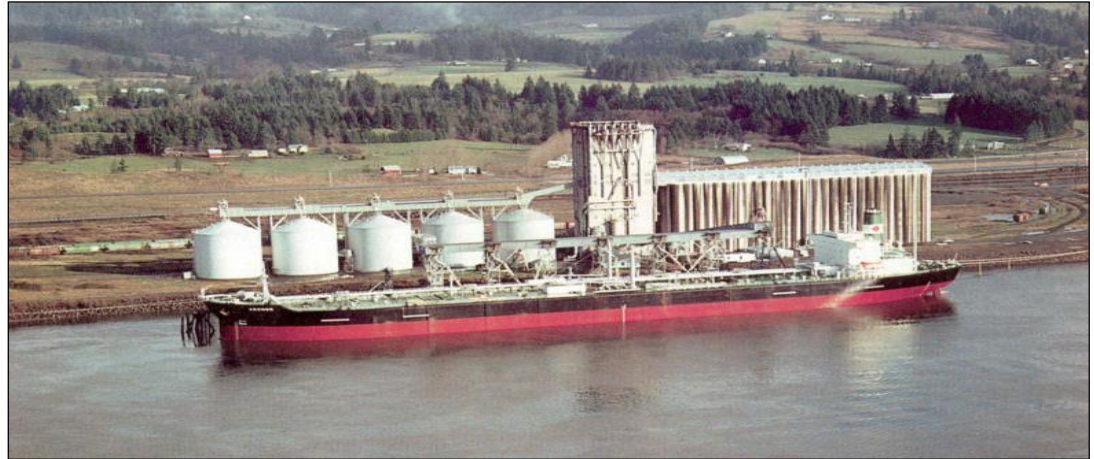
‘Western White’ = 10:90 to 90:10 blend –usually 10-30% club

United States: White winter wheat





Pacific Northwest (PNW)



PNW Soft White wheat production:

5.5 mmt/year

0.4 mmt Club, 5.1 mmt 'Common'

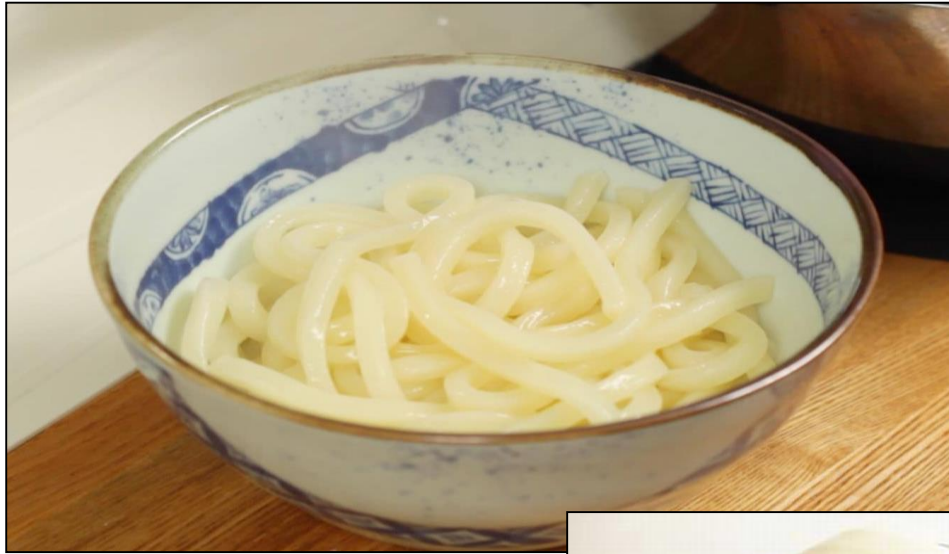




はんのりバター風味でうれしい、色とりどりのタッキー。多彩なおいさをお届けします。

 <p>アーモンドロールクッキー アップルとアップルパイの風味が、アーモンドの風味と相まって、とってもおいしいクッキー。</p>	 <p>ココアロールクッキー 濃厚なココアとアーモンドの風味が、とってもおいしいクッキー。</p>	 <p>アーモンドクッキー アップルとアップルパイの風味が、アーモンドの風味と相まって、とってもおいしいクッキー。</p>	 <p>フルーツロールクッキー アップルとアップルパイの風味が、アーモンドの風味と相まって、とってもおいしいクッキー。</p>	 <p>ココアロールクッキー 濃厚なココアとアーモンドの風味が、とってもおいしいクッキー。</p>	 <p>ココアロールクッキー 濃厚なココアとアーモンドの風味が、とってもおいしいクッキー。</p>
 <p>クリスピークッキー サクサクとした食感で、とってもおいしいクッキー。</p>	 <p>クッキーロールクッキー アップルとアップルパイの風味が、アーモンドの風味と相まって、とってもおいしいクッキー。</p>	 <p>アーモンドクッキー アップルとアップルパイの風味が、アーモンドの風味と相まって、とってもおいしいクッキー。</p>	 <p>フルーツロールクッキー アップルとアップルパイの風味が、アーモンドの風味と相まって、とってもおいしいクッキー。</p>	 <p>ココアロールクッキー 濃厚なココアとアーモンドの風味が、とってもおいしいクッキー。</p>	 <p>ココアロールクッキー 濃厚なココアとアーモンドの風味が、とってもおいしいクッキー。</p>





Soft White variety characteristics:

(based on Western Wheat Quality Lab)

Test weight: 80.9 kg/hL

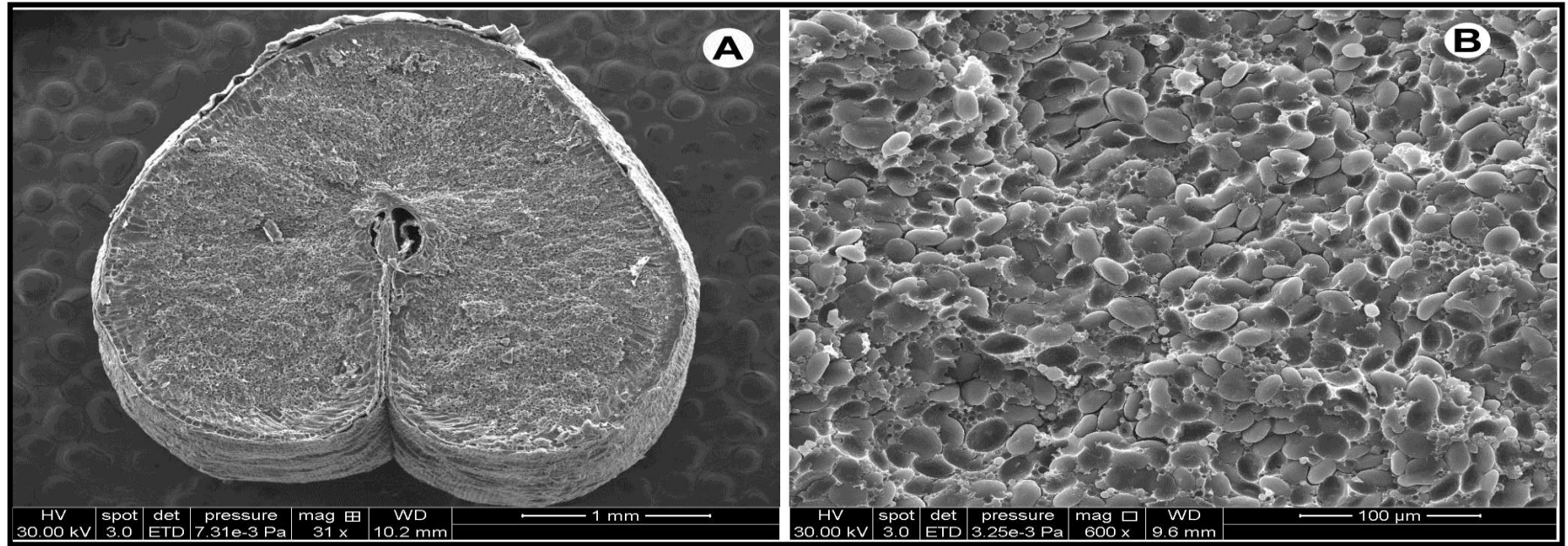
Protein (12% mb): 10.5%

Moisture: ~9%

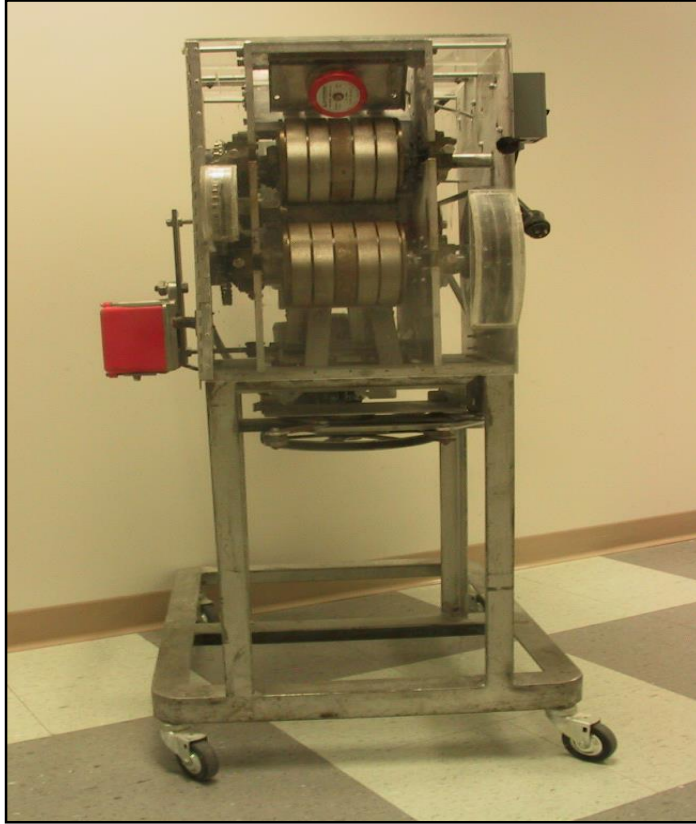
Quadrumat break flour yield: 42.6%

Quadrumat flour yield: 64.5% @ 0.33% ash

Miag Multomat flour yield: ~75% @ 0.50% ash



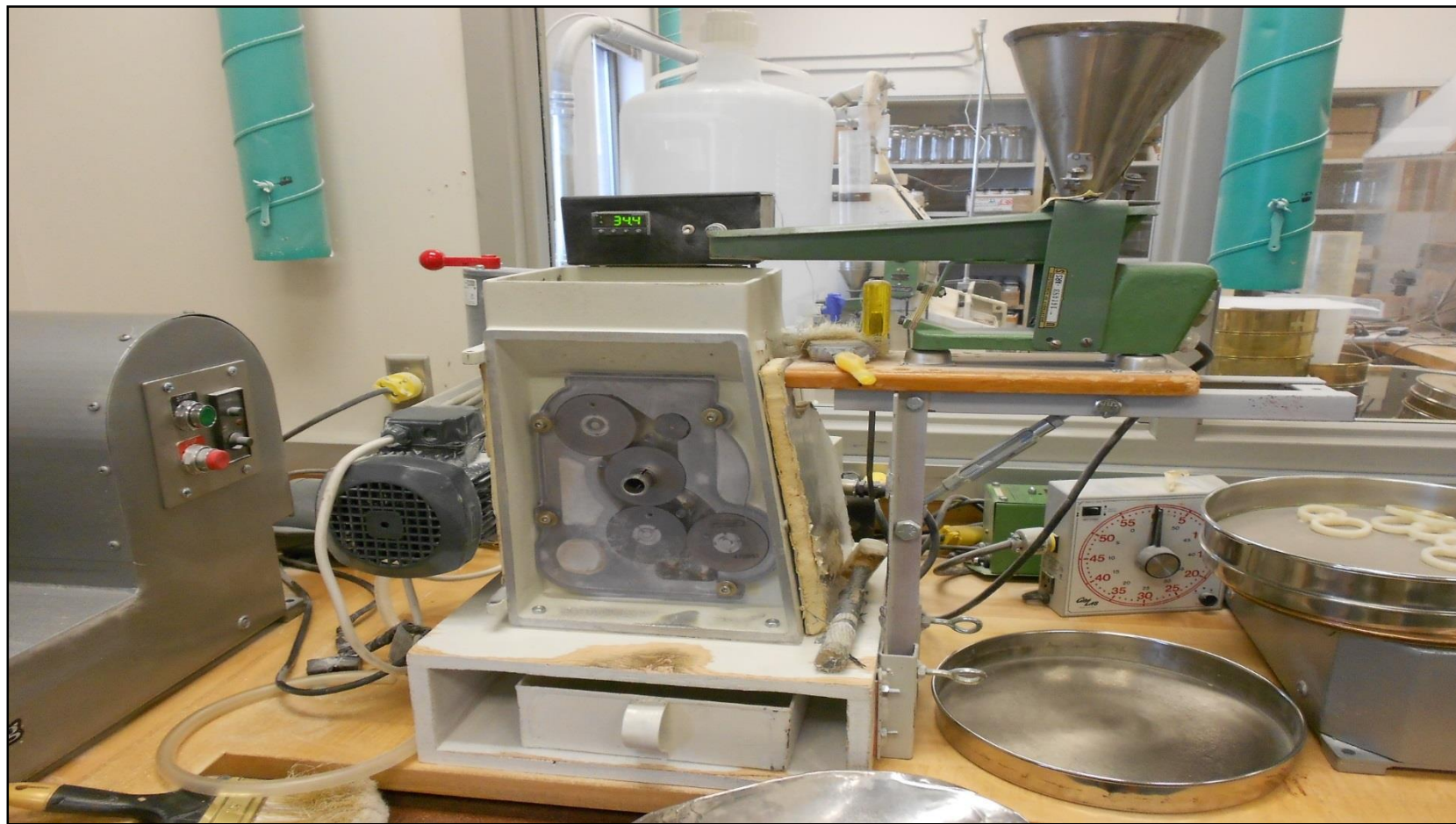
Soft endosperm



**Micro mill
for early generation
testing**



Modified Quadrumat



Soft White variety characteristics:

(based on Western Wheat Quality Lab)

Solvent Retention Capacity

Water: 51-60%

Sucrose: 84-105%, mean 92.6%

Sodium Carbonate: 60-73%, mean 63.9%

Lactic Acid: 69-133%

Gluten strength: weak to medium-strong WWQL

USWA

Farinograph

development time 1.2-1.9 min 2.7 min

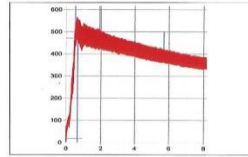
stability 0.9-12.9 min 3.3 min

Club wheat

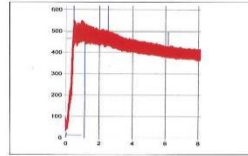
development time 0.7 min 1.8 min

stability 0.5 min 1.3 min

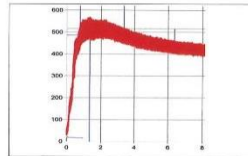
FARINOGRAPH



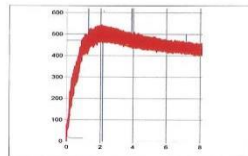
<8.5% Wheat Protein Range



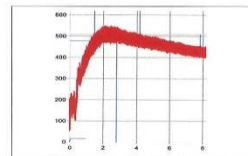
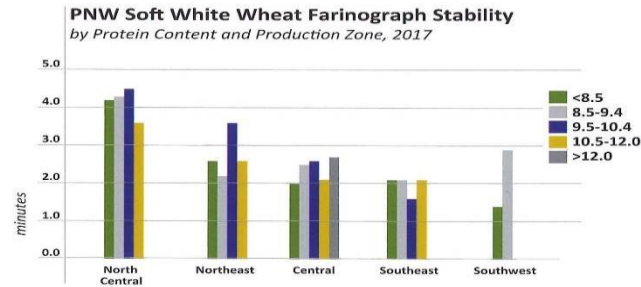
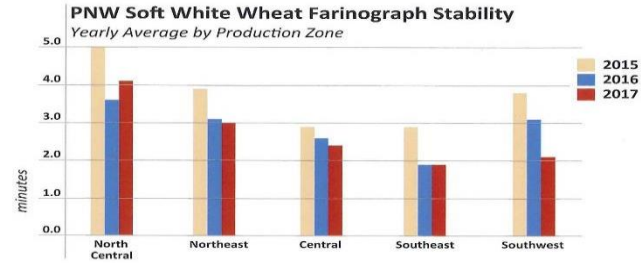
8.5-9.4% Wheat Protein Range



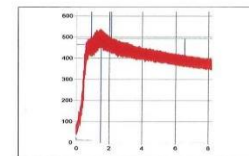
9.5-10.4% Wheat Protein Range



10.5-12.0% Wheat Protein Range



>12.0% Wheat Protein Range



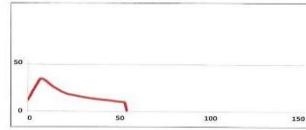
White Club Wheat

Gluten strength: weak to medium strong (USWA)

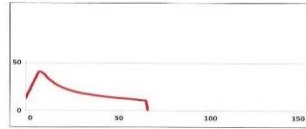
Alveograph L	102 mm
Club	76 mm
Alveograph W	103 10⁻⁴ joules
Club	49 10⁻⁴ joules
Wet Gluten (flour)	25.9%
Club	24.7%



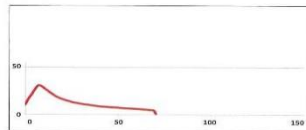
ALVEOGRAPH



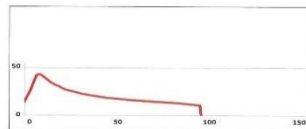
<8.5% Wheat Protein Range



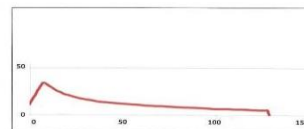
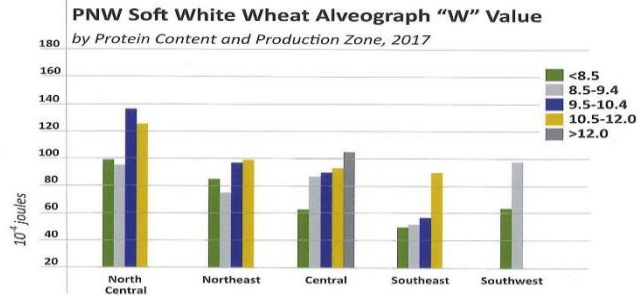
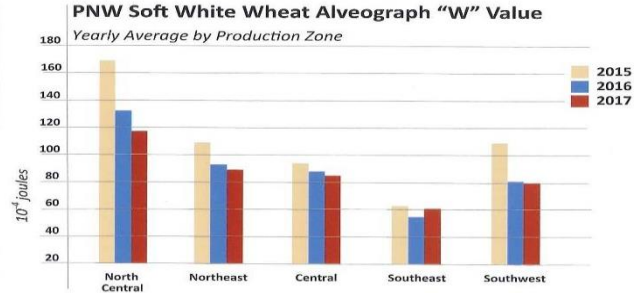
8.5-9.4% Wheat Protein Range



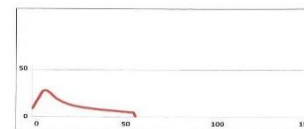
9.5-10.4% Wheat Protein Range



10.5-12.0% Wheat Protein Range

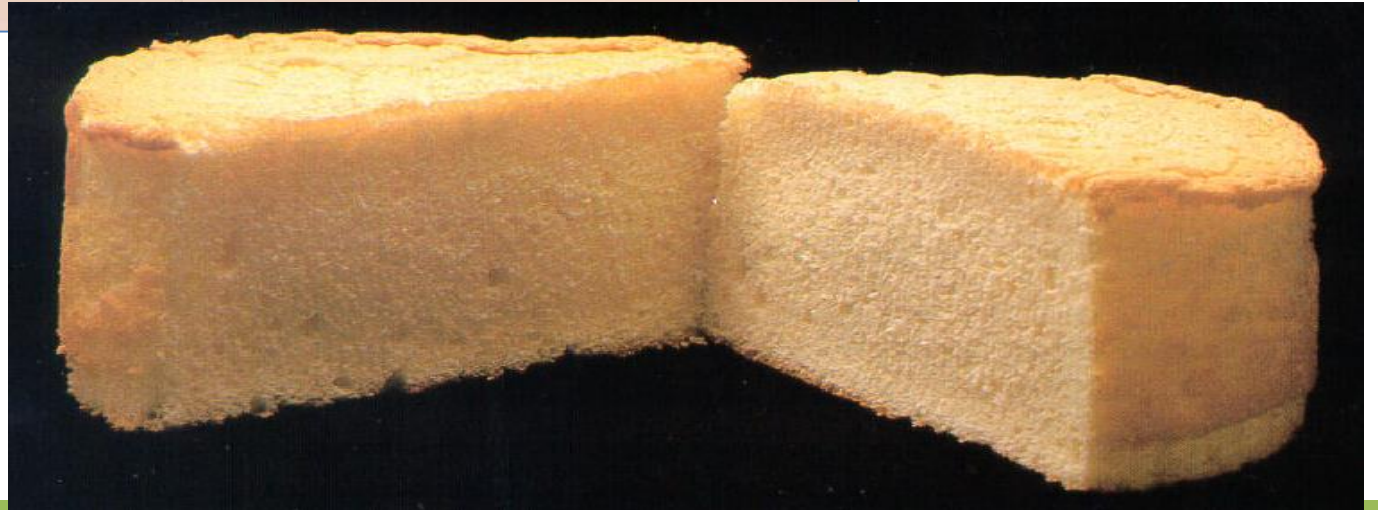


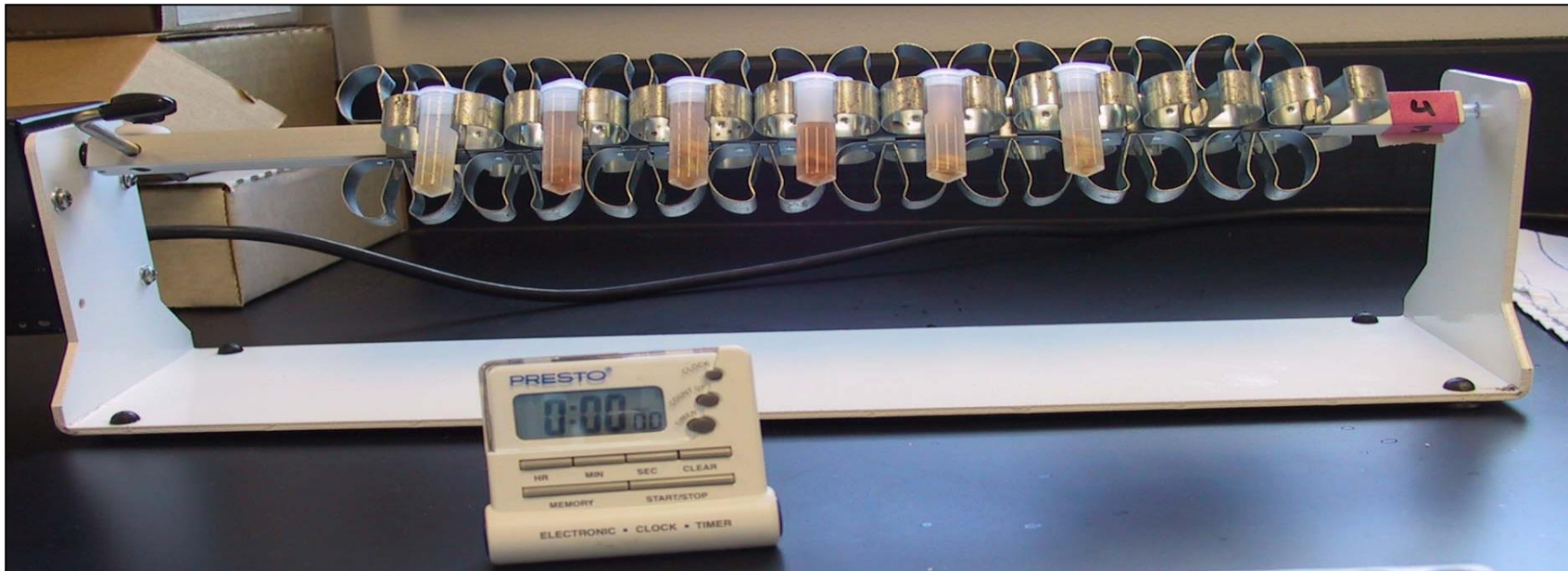
>12.0% Wheat Protein Range



White Club Wheat







L-DOPA assay for PPO

An Improved Whole-Seed Assay for Screening Wheat Germplasm for Polyphenol Oxidase Activity

James V. Anderson and Craig F. Morris*



Approved Methods of Analysis • 11th Edition



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AACC International Approved Methods

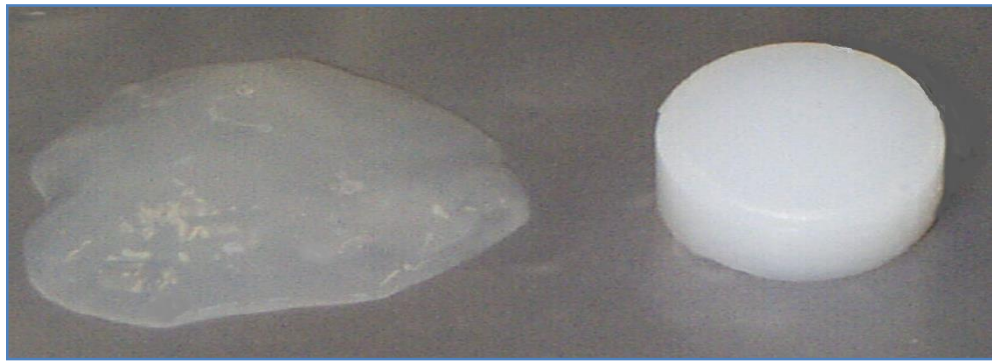
Enzymes

AACCI Method 22-85.01
Measurement of Polyphenol Oxidase in Wheat Kernels
(L-DOPA Substrate)

[VIEW METHOD](#)

Objective

Discoloration in dough is an end-use quality defect. A bright, clear color that remains stable over time is desired. Discoloration, in the form of grey, brown, or green shades, or general "dullness," has long been attributed to polyphenol oxidase (PPO). PPO is located predominately in the bran coat of wheat kernels. Problems with enzymatic discoloration occur in Asian noodles (especially alkaline noodles) and in any doughs, including refrigerated doughs, that are held for periods of time before baking or boiling. This method is a relatively rapid, small-scale, nondestructive test for PPO; applicable to both breeding and commercial applications. It utilizes L-dihydroxyphenylalanine (L-DOPA) as a substrate, and meets the criteria for a practical test for breeding programs. The L-DOPA method here is specific for whole wheat kernels, but it can be adapted for use on flour or ground wheat samples.





Thank you!

