



Wheat Retreat

Milling Session Slides

Thursday May 1, 2025

Alison M. Duncan, PhD, RD, FDC, FCNS

Nobert Cabral, Manager Milling





The Basics on Wheat

- Wheat is grown across Canada on thousands of family-owned farms
- Wheat is a member of the cereal grains family (which also includes barley, rye, and oats)
- Canada refers to wheat as a grain
- Latin America refers to wheat as a cereal





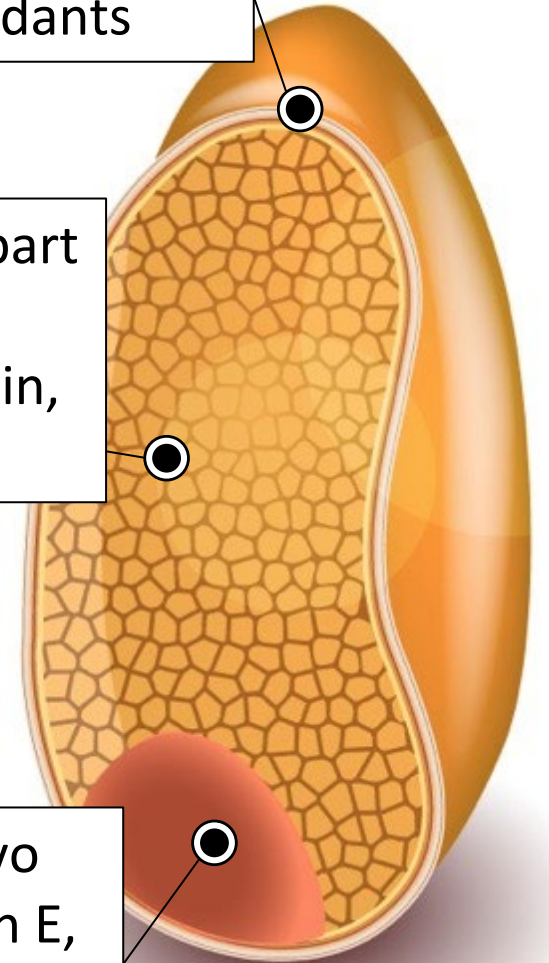
Wheat nutrition

- Wheat is a plant that includes roots, leaves, flowers and seeds
- The wheat seeds, also called kernels, are the part of the wheat plant that are milled to produce a range of wheat flours

Bran: outer layer that contains dietary fibre, B-vitamins, antioxidants

Endosperm: largest part that contains carbohydrates, protein, some micronutrients

Germ: plant's embryo that contains vitamin E, B vitamins, some minerals, healthy fats



Top Exports of Canadian Wheat



CWAD



CWRS



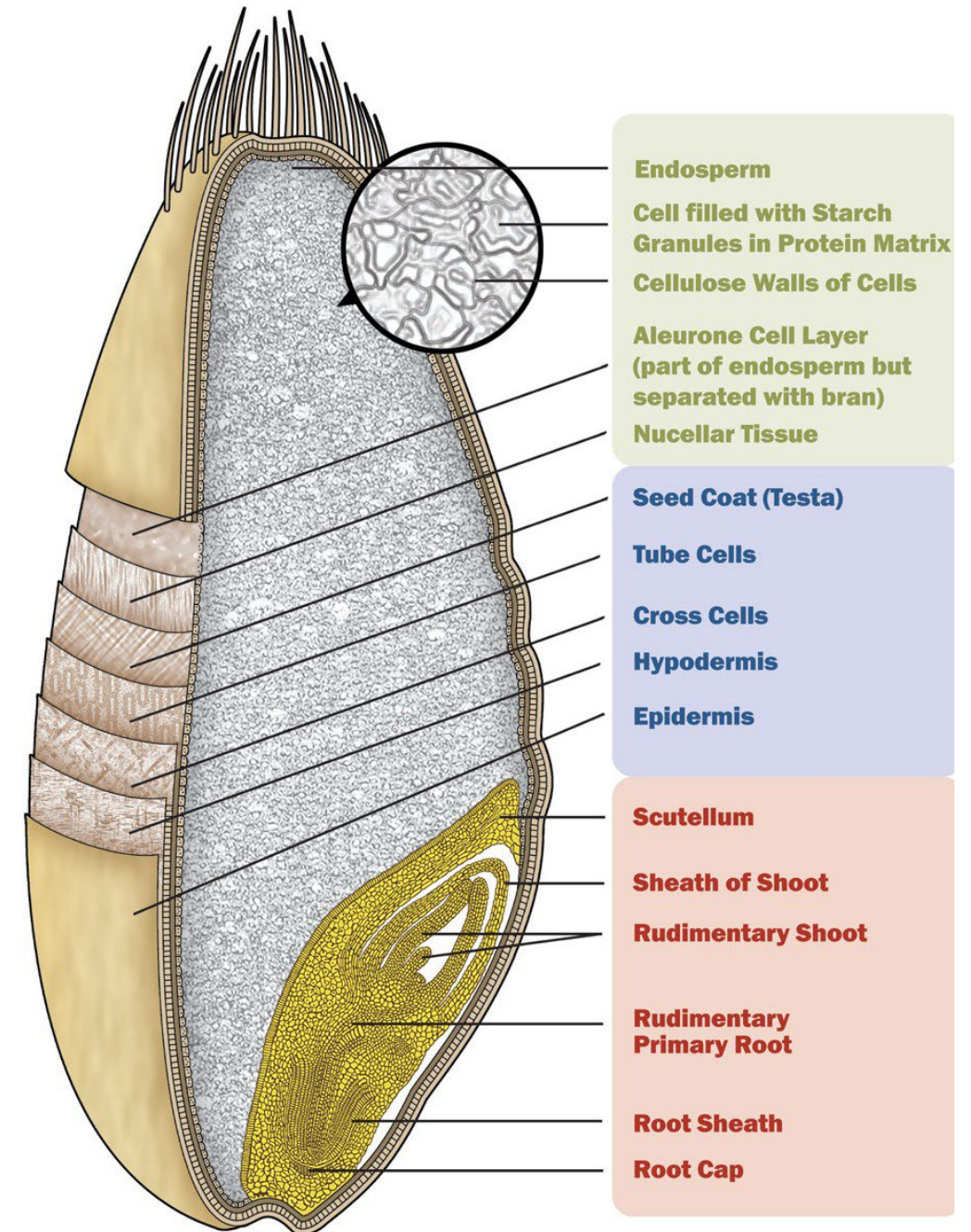
CPSR



CESRW

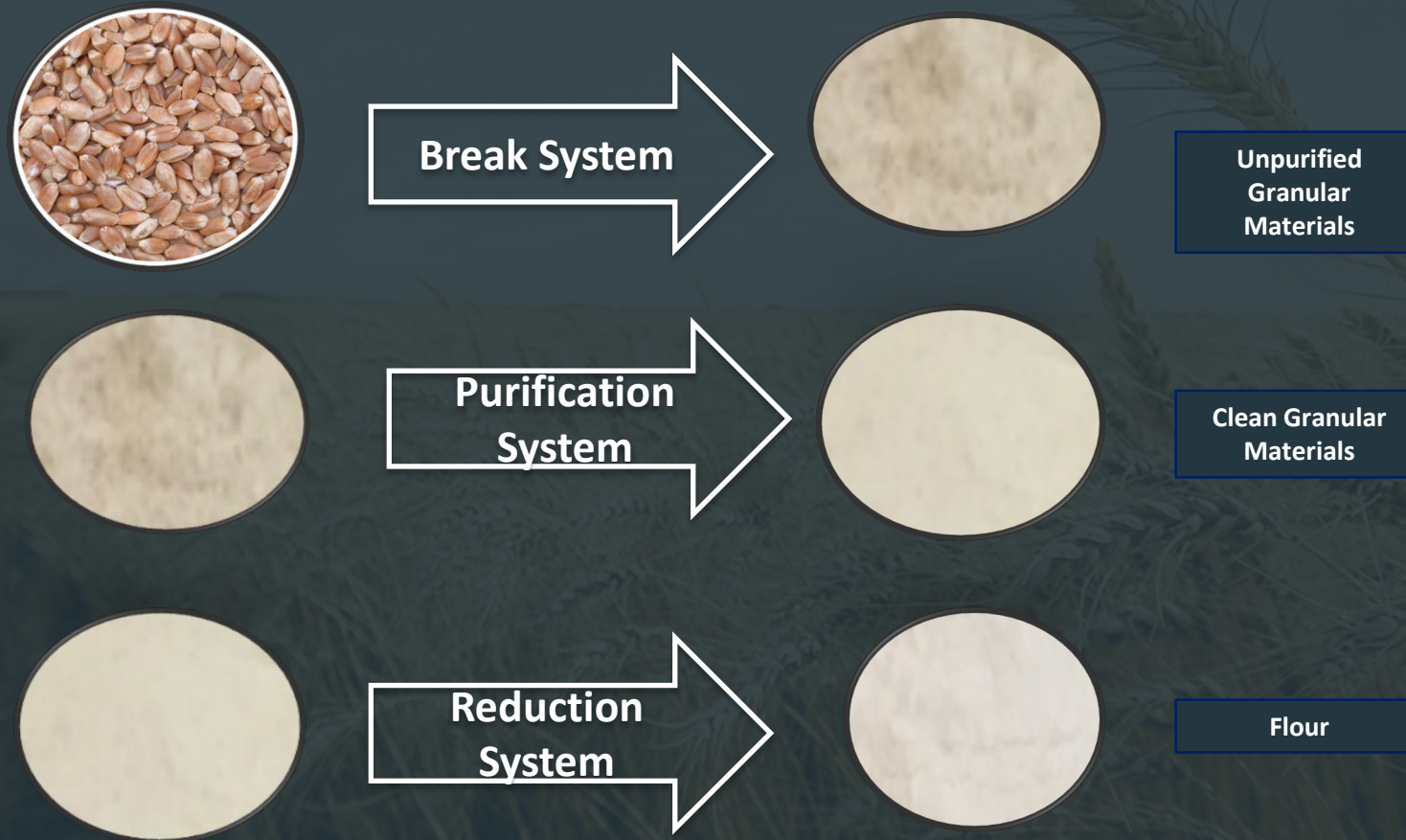


Wheat Kernel

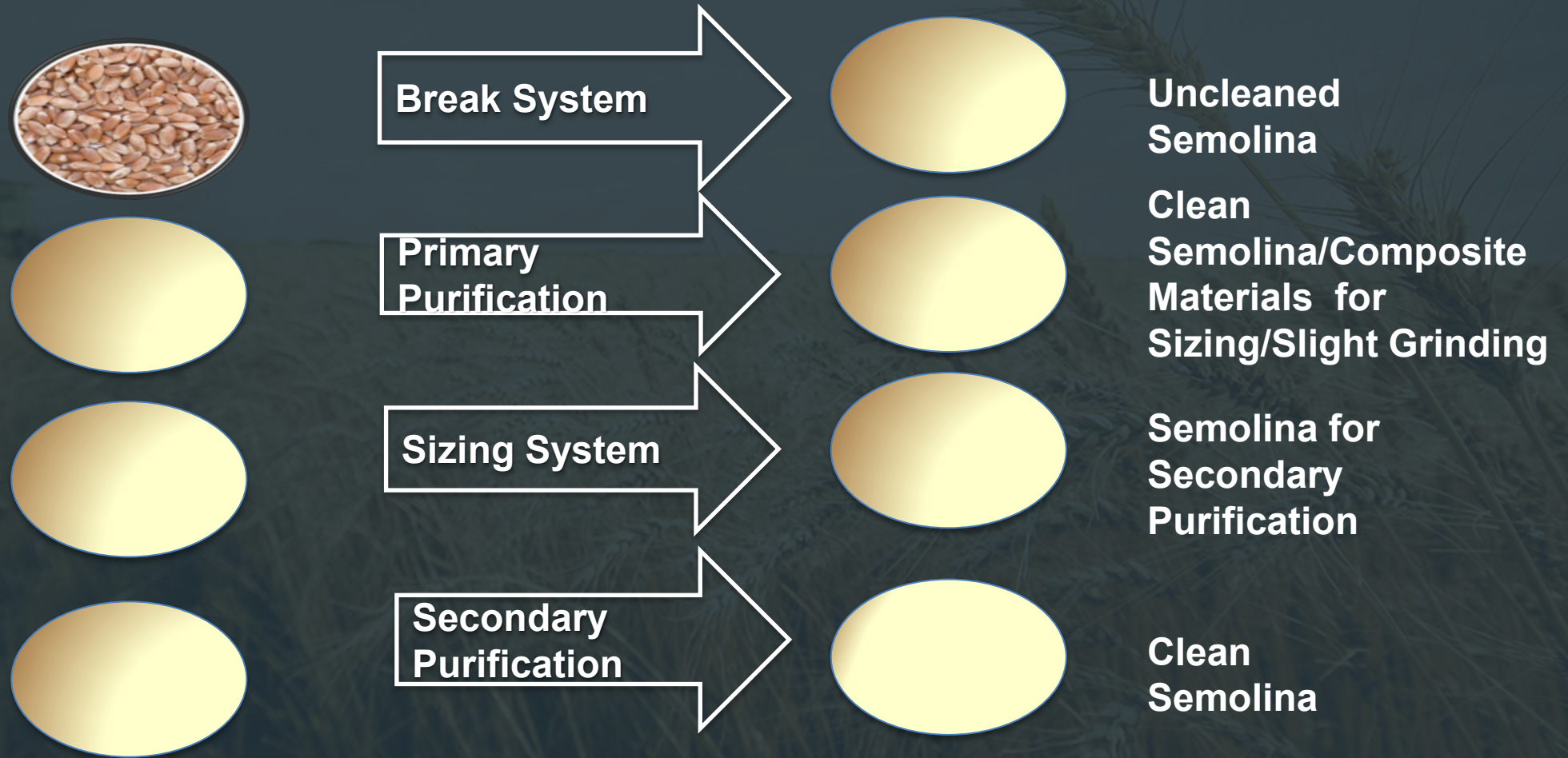


Longitudinal Section of Grain of Wheat

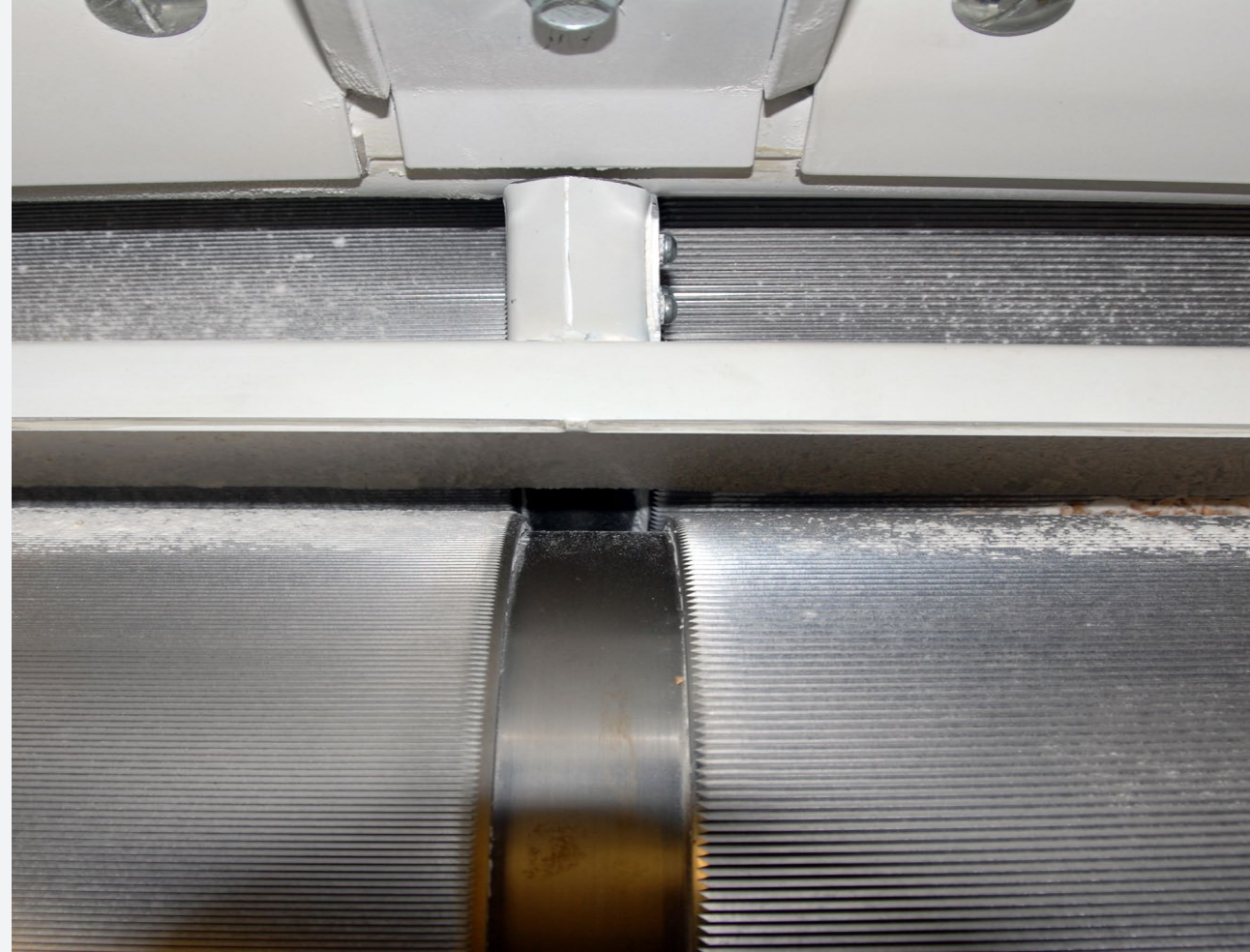
Common Wheat Milling



Durum Wheat Milling



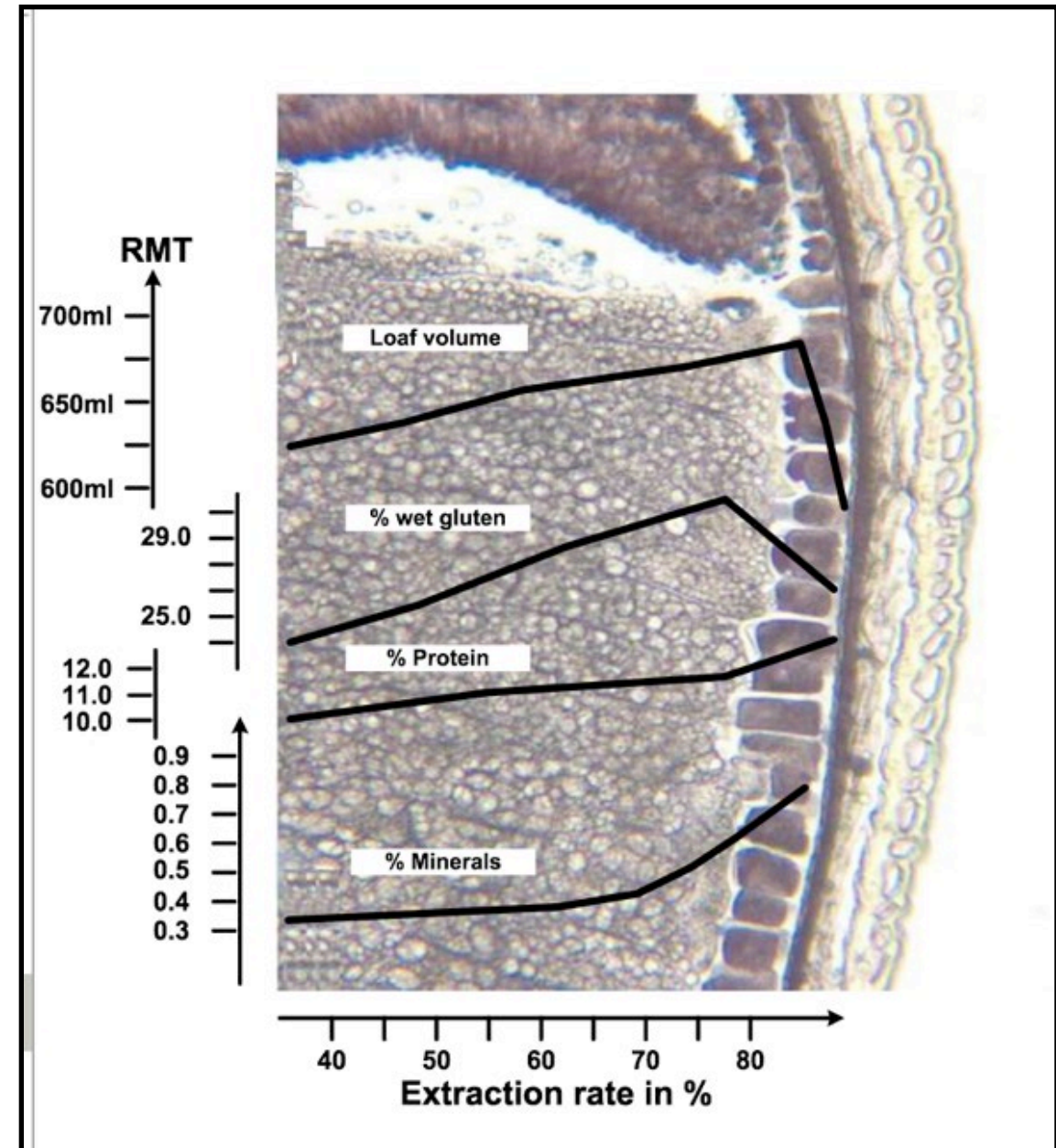
Corrugated Roll



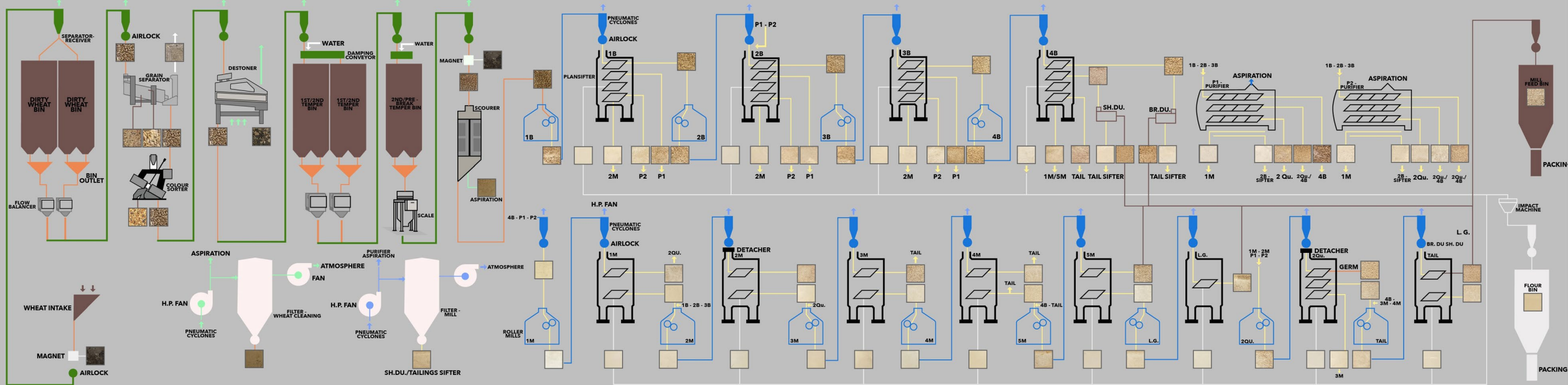
Smooth Roll



Milling and Flour Properties



Pilot Mill



Laboratory Mill Cumulative Ash Calculation

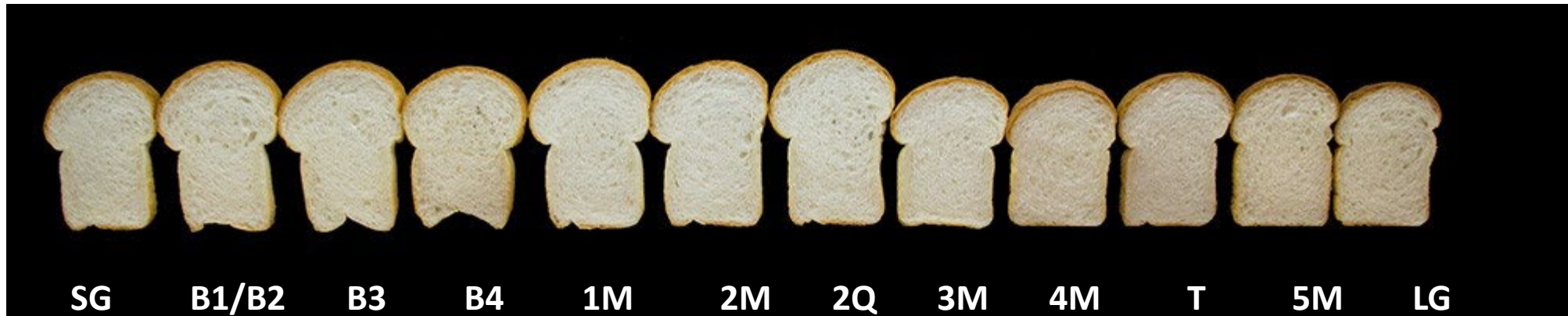
Passage	ASH	WEIGHT	%YIELD	CUM.YIELD	ASH*%YIELD	CUM(A*Y)	CUM.ASH
1M flour	0.37	7770	40.78	40.78	14.96	14.96	0.37
2M flour	0.43	2555	13.41	54.19	5.70	20.66	0.38
B2 flour	0.44	1455	7.64	61.82	3.35	24.01	0.39
B1 flour	0.44	987	5.18	67.00	2.28	26.29	0.39
B3 flour	0.64	312	1.64	68.64	1.05	27.34	0.40
3M flour	0.69	786	4.12	72.76	2.83	30.17	0.41
Bran thrus	1.82	360	1.89	74.65	3.43	33.60	0.45
Shorts thrus	1.97	113	0.59	75.25	1.17	34.77	0.46

Pilot Mill Cumulative Ash Curve

PASSAGE	ASH	WEIGHT	%YIELD	CUM.YIELD	ASH*%YIELD	CUM(A*Y)	CUM.ASH
1M	0.34	38500	26.16	26.16	8.94	8.94	0.342
2M	0.36	11850	8.05	34.21	2.90	11.84	0.346
3M	0.37	12786	8.69	42.90	3.19	15.03	0.350
B1+B2	0.49	10918	7.42	50.31	3.60	18.63	0.370
2Q	0.49	13044	8.86	59.18	4.31	22.94	0.388
B3	0.58	9743	6.62	65.80	3.82	26.76	0.407
4M	0.58	1775	1.21	67.00	0.70	27.46	0.410
5M	0.82	4749	3.23	70.23	2.64	30.10	0.429
B4	0.96	2518	1.71	71.94	1.65	31.74	0.441
T	1.10	5395	3.67	75.61	4.01	35.76	0.473
LG	1.52	1316	0.89	76.50	1.36	37.12	0.485

Stream Analysis

No Time Dough Formula





Wheat nutrition: Wheat Flours defined



What is it?

Whole grain wheat flour: includes all of the wheat kernel (endosperm, bran, germ).

Whole wheat flour: includes all of endosperm but only some of bran and very little of the germ.

Refined wheat flour: includes all of endosperm but none of the bran or germ. Enriched with thiamin, niacin, riboflavin, iron and fortified with folic acid.

What to look for?

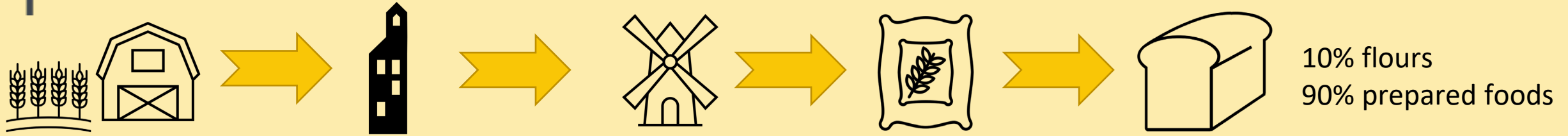
Whole grain wheat flour

Whole wheat flour

Enriched or all-purpose wheat or white flour



From farm to fork



Wheat-based foods are dietary staples and are recommended by governmental organizations worldwide, especially whole grains.

Canada's Food Guide: one-quarter of your plate with whole grain foods.

United States 'My Plate' dietary guidelines: one-quarter of the meal be grains.



Wheat Nutrition Basics: Research Spotlight



> [Public Health Nutr.](#) 2020 Dec;23(18):3324-3331. doi: 10.1017/S1368980020001688.
Epub 2020 Aug 10.

Consumer confusion about wholegrain content and healthfulness in product labels: a discrete choice experiment and comprehension assessment

Parke Wilde ¹, Jennifer L Pomeranz ², Lauren J Lizewski ¹, Fang Fang Zhang ¹

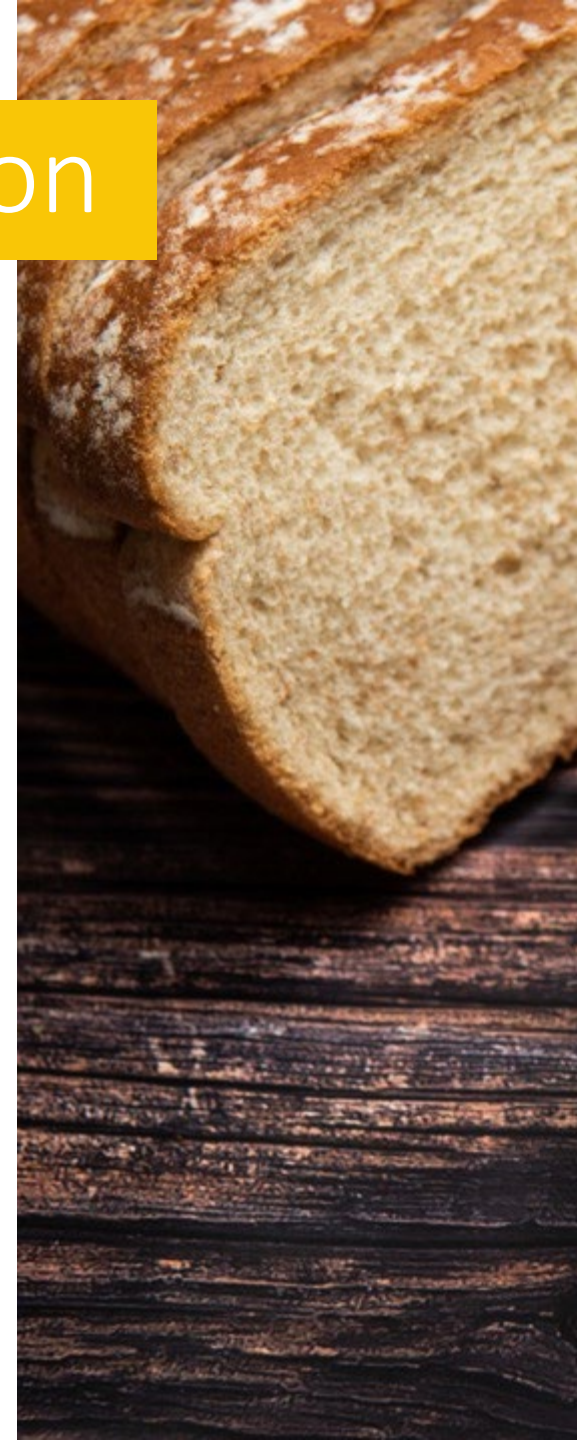
- Survey of n=1080 US adults
- Examined consumer perception of whole grain content of products
- Shown various products (breads, cereals, crackers)

- **Whole grain content was over-estimated by 43-51%** of participants
- **Consumers may be misled** by product indicators such as multi-grain or honey wheat



Refined wheat and nutrient fortification

- Refined wheat is milled to remove the bran and germ
- Produces an appealing texture and longer shelf-life
- In Canada, all refined wheat must be enriched and fortified with micronutrients
 - Mandatory: thiamin, riboflavin, niacin, folic acid, iron
 - Voluntary: vitamin B6, pantothenic acid, magnesium, calcium





Refined Wheat and Nutrient Fortification:



Research Spotlight



ORIGINAL RESEARCH
published: 06 September 2021
doi: 10.3389/fnut.2021.655464

The Role of Fortified and Enriched Refined Grains in the US Dietary Pattern: A NHANES 2009–2016 Modeling Analysis to Examine Nutrient Adequacy

Yanni Papanikolaou^{1*} and Victor L. Fulgoni III²

- Used NHANES data to examine the impact of fortified refined grains on nutrient adequacy in >20,000 adults
- Modelled nutrient intake consequences of removal and/or elimination of various refined grains (breads, RTEC, all grains) from the diet

- Results showed that **removal of specific refined grains** led to an increased percent of Americans **not meeting recommendations for several shortfall nutrients**, including dietary fiber, folate, iron, and magnesium
- Evidence that **refined grains contributes to nutrient adequacy**



What About Wheat? is brought to you by the Canadian Wheat Nutrition Initiative (CWNI), a group that knows wheat from farm to fork. CWNI members include grower associations and millers from across Canada.

CWNI is supported by a Science Advisory Council made up of food and nutrition professionals. With their knowledge and expertise, you can rely on What About Wheat? for accurate and useful information about wheat nutrition.

