
ANCHOR YEAST

GUIDE TO CEREAL ENZYMES



CONTENTS:

(Click to view)

Flour Components / Substrates:



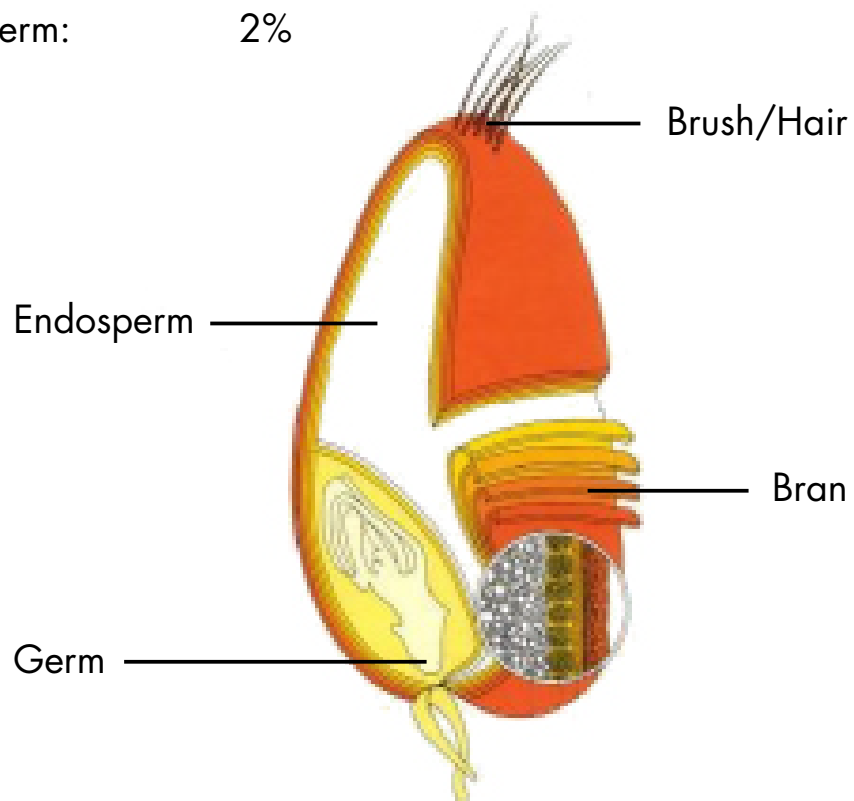
ENTER

ENZYMES AND FLOUR



WHEAT & FLOUR COMPOSITION

Endosperm: 80-82%
 Bran: 16-18%
 Germ: 2%



Substrate	%	Main enzyme class
Starch	67 - 70	α - amylases β - amylases Maltogenic amylases Glucoamylase
NSP	1 - 3	Hemicellulases Cellulases Arabinofuranosidase
Proteins	8 - 15	Exo - proteases Endo - Proteases Oxidases
Lipids	1 - 3	Lipases Phospholipases Galactolipases Lipoxygenase

FLOUR

COMPONENTS / SUBSTRATES



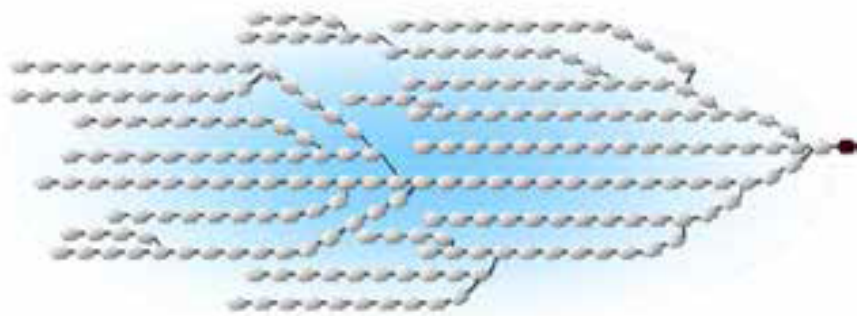
STARCH

COMPOSITION

Amylose - linear



Amylopectine - branched



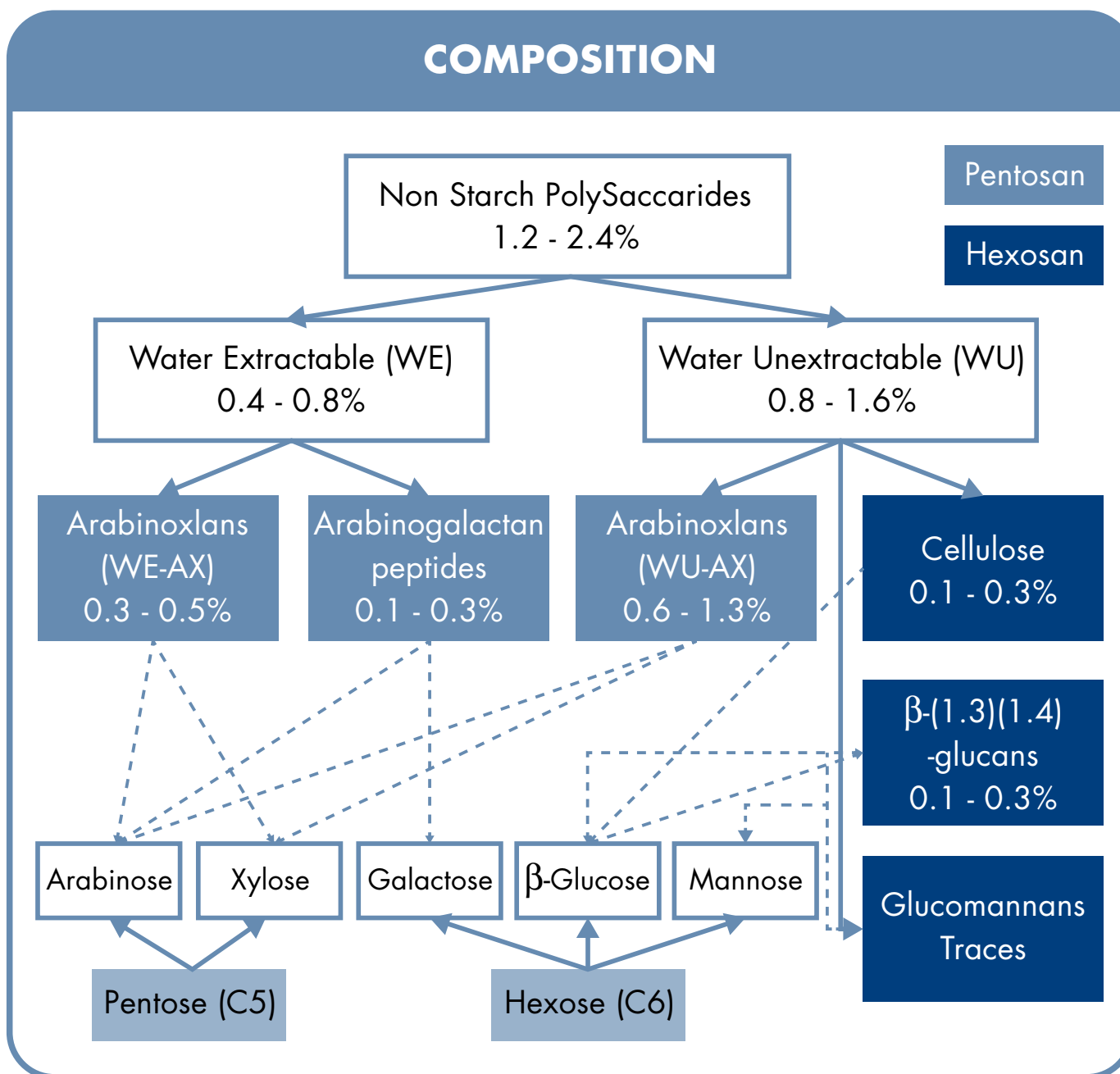
FUNCTION

- In dough starch granules are inert sand-like particles.
- Damaged starch can be hydrolysed by amylases into dextrin and maltose, leading to reduction of dough viscosity.
- Maltose can be fermented by the yeast.
- Amylase action results in faster fermentation by improvement of gas retention.
- During baking the starch gelatinizes resulting in crumb setting.
- Delay of crumb setting results in higher volume yield. This can be controlled using amylase.
- After cooking the retrogradation process takes places resulting in crumb firming.

FLOUR COMPONENTS / SUBSTRATES



NON STARCH POLYSACCHARIDES (NSP)



FUNCTION

- NSP have a major influence on dough rheology and baking performance.
- They have a function in water absorption of the flour and therefore an effect on bread softness.
- They disturb the gas retaining properties of the dough.
- They distribute the visco-elastic properties of the gluten network.
- They impact dough machinability and dough handling properties.

FLOUR

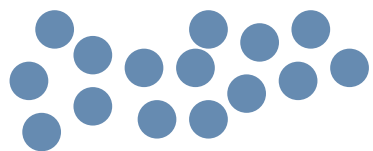
COMPONENTS / SUBSTRATES



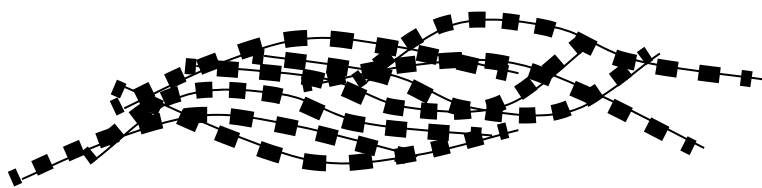
PROTEINS

COMPOSITION

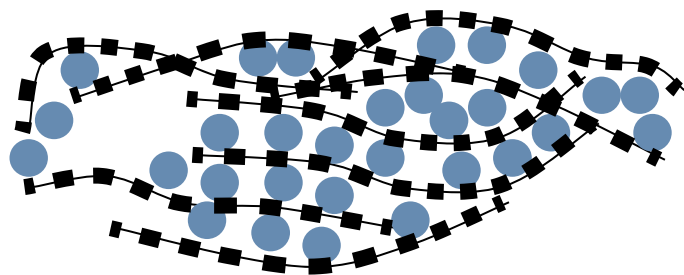
Gliadin



Glutenin



Gluten



FUNCTION

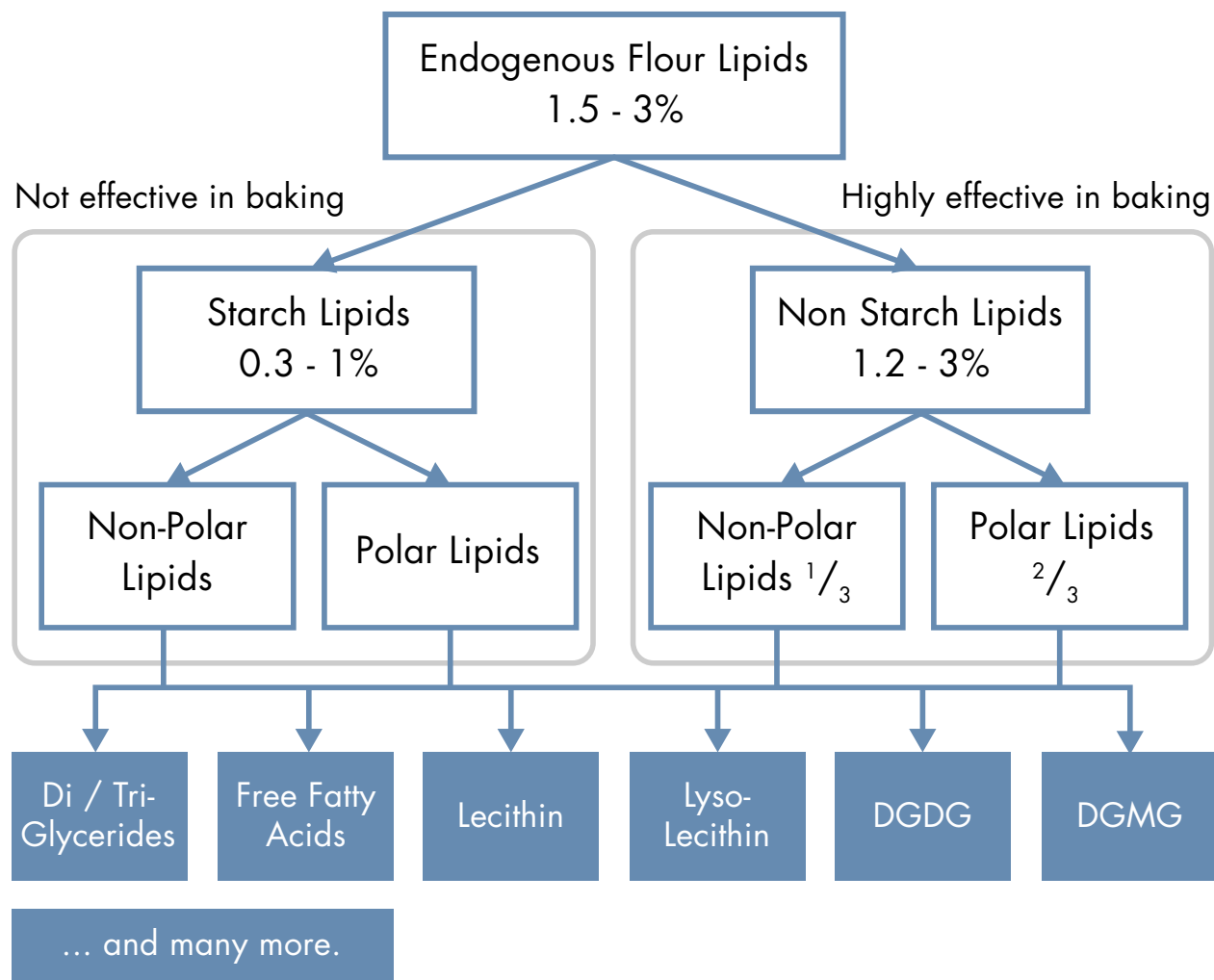
- Wheat flour contains 8 - 15% proteins.
- The major part is gluten forming proteins which makes wheat unique.
- During dough mixing these gluten forming proteins form a three-dimensional network by cross-linking gluten in polymers with gliadin.
- The gluten network is the continuous phase giving the dough its visco-elastic characteristics.
- Gluten composition largely determines the rheological properties and baking performance of the flour.

FLOUR COMPONENTS / SUBSTRATES



FLOUR LIPIDS

COMPOSITION



FUNCTION

- Wheat flour contains 1-3% Lipids of which two thirds is available to enzymes.
- Lipids are composed of polar and non-polar lipids.
- Polar lipids, Phospholipids and Galactolipids are effective in baking by influencing the stability of gas cells in the dough during fermentation.
- Phospholipases are used to improve the efficiency of the polar lipids.