

SOYBEANS IN THE BAKING INDUSTRY

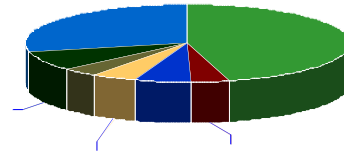
- Annual flour production 2.077 million tonnes
- Annual wheat requirement 2.6 million tonnes
- Industry turnover \$1.51 billion
- Industry employs 2000 people

Domestic Wheat Demand

- Estimated total annual demand
 - Flour Milling 2.6 million tonnes
 - Feed Usage 2.55 million tonnes
 - Seed Wheat 0.55 million tonnes
 - Total Domestic Demand 5.7 million tonnes
- Usage of 20 million tonne crop is 25%
- Usage of 9 million tonne crop is 60%

Flour use in Australia - 2002

1.87 million tonne

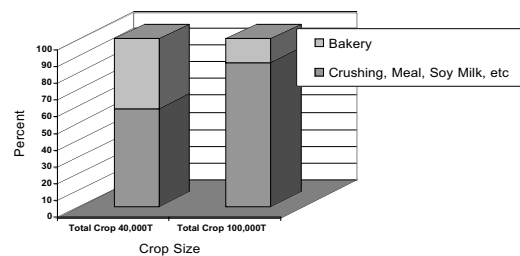


Export: 205,666t

Extract from Year Book Australia 2002 Agriculture Crops

	1997-98	1998-99	1999-2000
	000t	000t	000t
•Soybean	54	107	104
•Canola	698	1,247	1,911
•Sunflower	90	195	162

Bakery Soybean Requirements



Soybeans Receival Standards

Specification		Comments
Description	Sound Mature Beans, Light Hilum Varieties	Aids flour color and end product color.
		Shot beans have high enzyme activity.
Test Weight	Minimum Kg/Hl	70 Low weight can mean low plant recovery of flour
Moisture	Maximum	12% High moisture can result in moisture migration and mould growth during storage.
Defects		
Splits	Defined as Splits or Broken	10% High can mean low plant recovery of flour and degradation of oil quality.
Damaged Beans	Frosted, Weather Stained, Field Fungi discolored, Weed Stains, Heat damage, disease or insect damage.	3% High can mean low plant recovery of flour and degradation of oil quality. Can result in poor flour color.
Admixtures		
Foreign Material	All material other than Soybean material. Including small foreign seeds.	4% Low plant recovery of flour.

Soybeans Receival Standards

Other Contaminants		
Soil	Pea size pieces	5 Unacceptable Food Safety Issues and potential for microbiological contamination.
Objectionable Odorous, Musty or Mouldy Grains.	Grain which has any commercially objectionable foreign odor due to tainting or improper storage causing mould, souring and musty odorous.	Nil Unacceptable Food Safety Issues and potential for microbiological contamination.
Objectionable Matter	Sticks Stones Glass Concrete and any other commercially objectionable matter	Nil Unacceptable Food Safety Issues.
Chemical Residues	Seed Grain or Grain not meeting the residue standards of ANZFA.	Nil Unacceptable Food Safety Issues.

Bakery Food Applications of Soy Products

	White Bread and Rolls	Specialty Bread and Rolls	Cakes	Cake Donuts	Yeast Donuts	Sweet Goods	Cookies
Defatted Soy Flour							
Enzyme Active Soy Flour							
Low Fat Soy Flour							
Full Fat Soy Flour							
Lecithinated Soy Flour							
Lecithin							
Soy Grits							
Soy Protein Concentrate							
Soy Protein Isolates							
Soy Fibre							

Usage of Soy Products in the Baking Industry

Baking's first application of Soybean flour was reported in 1926 in the US where it promoted as a "Health Flour"

In today's modern bakery industry it has many and varied applications

- Nutritional Uses
- Functional Uses

Nutritional Applications (Some Examples)

Soy Fibre - Used as a fibre adjunct to produce high fibre white bread or as a fibre supplement in grain and Wholemeal breads.

Kibbled Soy Beans - Used as a dietary source of phytoestrogens.

Soy Oil - Used in bakery products where Soy Oil is seen as a healthier alternative to highly saturated fats

Functional Uses - Minor (Examples)

De-fatted Soy Flour - used as a specialty additive in Donut mixes to reduce fat absorption (imported from EU or US).

Lecithin - as an Emulsifier where a special purpose or a natural emulsifier is required.

Functional Uses - Major

Used as a major ingredient in Bread Improver.

Bread improver is a mix of functional ingredients added to bread to aid in the manufacturing process and finished product quality.

Bread Improver Composition

Ascorbic Acid

Soy Flour (Full Fat, Enzyme Active)

Emulsifier(s)

Enzymes

Filler (wheat flour, calcium carbonate)

What does the Soy Flour do???

Inclusion of Soy Flour in Bread Dough at levels of 1-5% imparted characteristics of stronger flour, the effect increasing with increasing Soy flour level.

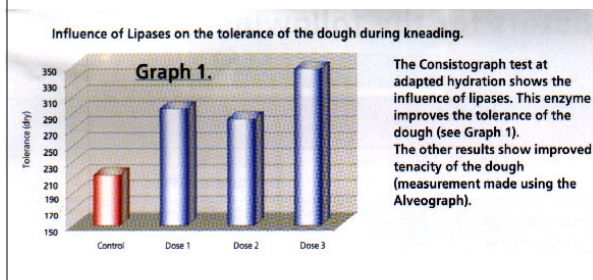
The Lipoxidase enzyme system plays an important role in bleaching the Yellow Pigments in the Flour during processing.

How does it do it???

It is due to Soy Flour lipoxygenase interaction within the system effecting mixing tolerance and improving rheological properties of the wheat flour dough.

Lipoxygenase had no effect when those compounds were added to defatted flour, showing that free lipids are required for lipoxygenase action. Adding linoleic acid to defatted flour restored the effect of lipoxygenase.

How does it do it???



Soy Flour and its Role in Bread Manufacture.

Bread can be manufactured without the addition of Soy Flour however both the Bread Eating and Keeping qualities are improved significantly by the incorporation of small quantities of Soy Flour in the Bread Formulation.

Soy Flour Manufacture

(Full Fat Enzyme Active)

- Cleaning of the Beans
- Cracking & De-hulling
- Size Reduction
- Sieving



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Challenges for the Future

Acceptance of GMO agricultural products in the Food Chain by all International and Australian Consumers.

GMO detection in processed foods

Developments in the automated detection of DNA will improve the reliability of detection of genetically modified sequences in processed food, thus helping companies label their product appropriately.

Challenges for the Future

IDENTITY PRESERVATION

Consumer confidence require an IP (Identity Preserved) Pathway to be maintained for Soybeans and their by-products

The Australian baking industry and their customers requires a
GMO free guarantee.

DNA Testing is conducted on domestic and imported Soyflour
products and C of A's supplied to clients.

Supply chain management will provide customers with confidence
in the product they purchase (and it is hoped prevent expensive
litigation).