May - June 2007

ENZYME WORLD

NATURAL
INGREDIENTS FOR
BAKING SUCCESS

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advanced enzymes
Where enzyme is life

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•State-of-the-art R&D Facility
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Time for Advanced Enzymes

advanced enzymes
Where enzyme is life

Significant technological advances are opening up new horizons in the arena of Enzyme Technology. Advanced Enzymes has always been at the forefront of change, leading it through innovation and cutting-edge research. Today, Advanced Enzymes is looking to go even further, expanding into new markets like China and Turkey. To power its progress Advanced Enzymes is also planning to issue an IPO at the end of the financial year.

In keeping with these burgeoning developments and to encapsulate the vibrant spirit of the organisation, Advanced Enzymes has opted for a change in its hallmark logo. The new logo is more in keeping with the dynamic, forward-looking spirit of the company that seeks excellence in developing world-class enzymes.

The well-defined strokes arching across the logo reflect the pursuit of excellence. The new vibrant colours reflect energy, dynamism and the unique combination of technology and nature. The dedication to developing technology that will further the progress of mankind while simultaneously ensuring that it is nature friendly. Green denotes nature. Blue representing technological standards, reinforces the importance of higher achievement and sustaining competitiveness.

Viewed in its totality, the logo depicts an organisation that is a wellspring of innovation, full of energy, always on the move, and aspiring for greater heights in its

Dear Friends,

Food is of great importance to human life! The Vedic scriptures equate 'Food' with 'BRAMHAN' itself. Annam Para-bramham!

The recent era is all set for 'Convenience Food' and 'Baked Food' is one of the most important aspects of this new trend, which has taken firm control of our lives now.

In the past, the Baking industry has used a substantial amount of ghee, oil, sugar and carcinogenic flour-improvers. Also, most baked goods use white flour (maida), which is not really good for the human digestive system. All the above ingredients, used extensively within the Baking industry contribute to a widespread loss of health as well as greatly increased levels of obesity and digestive disorders including Colon Cancer.

Gurudev Poojya Sri Sri Shankaraji has always said to take responsibility for all the problems we see in our society! We, at Advanced Enzymes have responded with a series of Enzyme-based products to meet the needs of the Baking Industry. Today, a host of high-quality target-specific enzymes such as Amylases, Proteases, Lipases, Phospholipase, Xylanase, Hemicellulase, Manannase, Laccase, Glucose Oxidase, etc. are available to produce high fibre, low sugar, low fat baked goods with a similar or improved taste!

At Advanced Enzymes, we have also decided that within the span of the next year, we will include high quality Yeast in our basket of products. An ultramodern, brand new Yeast manufacturing facility is being set up at Jalna in Maharashtra to cater to this growing need.

I would welcome your comments & suggestions so that all of us at Advanced Enzymes can serve you better!

Jai Gurudev.

Chandrakant Rathi,
Chairman

Enzymes in Baking

The most commonly used ingredient in baking is wheat flour. Flour provides bulk and structure to baked goods and is the basic ingredient in bread, crackers, cakes and cookies.

Wheat flour is derived from the berry or kernel of wheat. Wheat, as well as other cereal grains, contain natural endogenous enzymes, many of which are important in dough preparation and baking. However, even advanced milling techniques, as well as the new, improved wheat varieties tend to provide high quality flour that is enzyme-poor. As a result, there is a need for exogenous enzymes so as to maintain a consistency in the quality of finished baked goods.

Generally, wheat is classified as either soft or hard. Hard wheat kernels have a higher protein content and soft wheat, also called light wheat, yields soft flour with a lower protein content. Hard wheat flour is used more for yeast breads and soft flour is better for products like cakes. It is common for manufacturers to blend both - hard and soft wheat flours to produce 'all-purpose' flour that can be used in many different applications.

Typically, milled flour is composed of about 63%-77% starch, 15% water, 8%-14% protein and less than 1% fat. Gluten is the protein that forms a tough, rubbery consistency when wheat flour is mixed with water. Gluten strands provide the volume, texture and appearance of baked goods by trapping gases given off by yeast fermentation or leavening agents. Some products require the strengthening of gluten strands while others require weaker gluten strands to produce a softer consistency in the product.

Enzymes, Starch and Staling in Baking

The staling of baked goods is extremely costly to both-manufacturers and consumers. Essentially, staling is perceived as a loss of freshness in terms of flavor, increased firmness and a loss of moisture. It is estimated that as much as 5% of all baked goods are discarded due to this loss of freshness. While there are several factors in staling, researchers feel the primary cause is the phenomenon of starch retrogradation.

That is, the process by which starch undergoes a gradual change from an amorphous structure to a partially crystalline state, increasing firmness. The consensus among experts is that starch, especially amylopectin, modified by alpha-amylase plays a major role in slowing the staling effect.

Most commonly, fungal alpha-amylases are used to supplement natural alpha-amylase activity of flour. These amylases produce short-chain dextrins and primarily maltose, a fermentable sugar important in the fermentation process. Fungal alpha-amylase products like SEBamyl-XP, SEBamyl X50P and SEBamyl XCP are used as conditioners to improve bakery mixes and bread, cake and other doughs. When added to bread flours, the maltose and dextrins that are produced significantly increase the fermentation rate, improve the baking volume 5%-15%, crumb structure, softness and crust color. Further, the use of a fungal alpha-amylase can eliminate or at least reduce the need for added sugar to the dough. In the competitive world of modern bread making, maintaining shorter fermentation times is a very cost-effective procedure. Therefore, the high activity of alpha-amylase found in SEBamyl products is ideal for small as well as large-scale bread making operations.

Glucoamylase serves an important function in softer breads like buns and rolls. SEBamyl-GLS is a glucoamylase that hydrolyzes the alpha-1,4-glycosidic bond from the non-reducing end of wheat

starch. The result is large amounts of glucose and limited dextrinization of the starch. The increased glucose content greatly enhances the yeast fermentation rate, producing softer baked goods with higher volumes and richer crust color.

The complete line of SEBamyl products is food-grade, kosher-certified and derived from non-GMO organisms.

Enzymes and Pentosans in Baking (Dough Conditioning)

Pentosans are a variety of non-starch polysaccharides and a part of the many compounds that make up hemicellulose, an important part of the cell wall of plants. Wheat typically contains about 3-4% (w/w) pentosans while other grains, like rye may contain up to 8%. Pentosans play an important part in dough preparation in terms of volume, freshness and crumb texture in the finished product. Much of this activity is due to pentosans' ability to absorb water and interact with gluten. The enzymatic hydrolysis of pentosans conditions the dough, making it easier to handle. It benefits the finished bread in terms of larger loaf volume and softer crumb texture. Enzymes like hemicellulase, pentosans or xylanases are used for this purpose. When pentosans are combined with alpha-amylase enzymes, the crumbs and over-all texture are even softer.

The SEBake line of dough conditioning enzymes are all food-grade, kosher-certified and derived from non-GMO organisms. When added to flour, SEBake products reduce mixing time, improve the machine handling characteristics of dough and the quality of the finished bread. Several of the SEBake products are discussed below.

SEBake-X, SEBake-FAX, SEBake-CEL and SEBake-Fresh improve the elasticity of the dough gluten/pentosan complex, enhance dough stability and strength, increase loaf volume and soften crumb texture. SEBake can be used in combination with or replace emulsifiers in a variety of bread products, as described below.

SEBake-CLX is added to light (soft flour) flour batters. It reduces the mixing time and improves the volume of chemically-leavened baked goods. It reduces the viscosity of the pentosan/gluten complex, which results in a softer product with finer crumb texture. SEBake-CLX is excellent for cakes and pastries.

1. White, Whole-wheat, SEBake-X, SEBake Hearth breads, buns, rolls FAX, SEBake-Fresh

2. White, multi-grain, SEBake-CEL High-fibre, whole-wheat, buns, rolls, bagels and wheat-flour tortillas

3. Biscuits, doughnuts, SEBake-CLX muffins, cakes and crackers

Enzymes and Gluten in Baking

Gluten is a combination of two proteins, gliadin and glutenin. During dough preparation, gluten protein binds with water forming a kind of lattice structure. Protease enzymes cleave bonds within the gluten protein, which creates a softening effect on this structure. Thus, the dough's elasticity and ability to stretch is greatly improved. This elasticity is essential to trap the carbon dioxide gas formed by the fermenting yeast that results in dough expansion. It is important to use a protease that is active yet acidic in the mild to neutral range. Both fungal and bacterial source proteases results in limited gluten hydrolysis, which in turn creates the desired softening effect.

SEB-Pro P is a fungal derived protease and SEB-Neutral is a bacterial source protease. Both these proteases are used to improve mixing, handling and baking qualities of strong flours used to make bread, cakes and pastries.

SEB-Neutral P and SEB-Neutral PL are a powder and liquid protease respectively, derived from a bacterial source. These products too, are food-grade, kosher-certified and derived only from non-GMO sources.

Consumers have rather specific expectations as to the taste, softness, density and crust texture of their baked goods. Further, consumers demands can and do change. Today, there is a shift toward bread products that are healthier. That is, more whole grain and fibre, which creates new requirements for everyone, from the miller to the baker. Still, the effective use of enzymes can help provide the exact type of flour, dough and end-product desired. Each kind of baked good has its enzyme needs. From crackers to bread to sponge cake, each product will benefit from the addition of quality enzyme products.

By Mike Smith

Enzymes Simplify and Improve the Baking Process

Enzymes are an important part of the baking industry. The role of enzymes in baking continues to grow because it is cost-effective for bakeries and provides a better product. From the consumer's perspective, they want products that are natural and free of chemical additives. Of course, these very same consumers do not want to give up product flavor, freshness and volume. Baking companies want to be able to provide what consumers want and make a profit in the process. The answer that satisfies everyone is enzymes.

As an example, enzymes can replace potassium bromate, a chemical dough conditioner that is already banned in a number of countries. Bromates have been banned in the United Kingdom, Canada and Costa Rica, among others. In 1991, California declared bromate a carcinogen under the State's Proposition 65. As a result, even in countries that do not ban bromates, many bakeries have either switched or are looking to switch to an enzyme process that avoids the use of potassium bromate. Chemical oxidants like the bromates, azodicarbonamide and ascorbic acid are still widely used to strengthen gluten when making bread. As an alternative, glucose oxidase like that in SEBake-GO may replace the use of these chemical oxidants and achieve better bread quality in the process.

Biotechnical advances in enzyme chemistry continue to provide advantages to the Baking industry. As an example, when dough is made, yeast begins metabolising fermentable sugars, producing alcohol and carbon dioxide (CO_2), the latter of which makes the dough rise. Bakers often add sugar to increase the availability of fermentable sugars to increase Co_2 production and thus, bread volume. Amylase enzymes like SEBamyl X50P not only eliminate the need for additional sugar, but also maximize the fermentation process providing an even crumb structure and high loaf volume. In addition, the maltogenic character of SEBamyl X50P improves shelf life by reducing the rate of staling. Commonly, emulsifiers are used as anti-staling agents, though maltogenic amylase is superior in every respect and effectively eliminates or reduces the need for emulsifiers.

Another way to reduce or eliminate the need for emulsifiers is with hemicellulase enzymes like xylanases and pentosans such as that in SEBake-X. This proprietary hemicellulase blend will improve the elasticity of the dough-gluten-pentosan complex, which in turn improves the stability of the dough and increases the volume of the finished product. SEBake-X can work with or replace emulsifiers.

Gluten is a combination of proteins that forms a large network during dough formation. This network holds the gas in during dough proofing and baking.

The strength of this gluten network is therefore extremely important to the quality of all bread raised using yeast. Enzymes such as hemicellulases, xylanases, lipases, proteases (SEBake PP) and oxidazes can directly or indirectly improve the strength of the gluten network and so improve the quality of the finished bread.

Clearly, the use of enzymes in baking provides many advantages, the most important of which is a great tasting product. Enzymes eliminate or reduce the need for bromates, emulsifiers, sugar and chemical oxidants. At the same time, they increase the volume of the bread, delay the staling time and enhance crumb texture and mouth feel. Truly, enzymatic solutions are cost-effective and provide a better quality end-product.

Advanced Enzymes Technologies Ltd., is a research-driven company with a global leadership in manufacturing enzymes & probiotics, dedicated to marketing eco-safe solutions to a wide variety of Industries like Pharmaceuticals, Nutraceuticals, Animal Healthcare, Baking, Agriculture, Waste Management, Textile, Leather, Distilling, Grain Processing, Brewing, Juice Processing, etc.

Advanced Enzymes Technologies Ltd., aims to replace all harsh drugs and chemicals used in treating healthcare as well as industrial problems with eco-safe solutions using enzymes and probiotics.

It is not surprising then, that there is a yearly increase of instances in the commercial application of enzymes.

There is a significant trend towards the change in the eating habits in India and growing demand for bakery products. As the demand for bakery products increases day by day, so also the need for an improvement in the quality of products. To meet product demand, as well as for health conscious people, we at Advanced Enzymes Technologies Ltd., have launched enzyme-based products to help the baking industry.

Enzymes play an important role in the Baking industry. For decades, enzymes such as malt and fungal alpha-amylases have been used in bread-making. Rapid advances in biotechnology have made a number of exciting new enzymes available to the Baking industry. The importance of enzymes is likely to increase as consumers demand more natural products free of chemical additives. For example, enzymes can be used to replace potassium bromate, a chemical additive that has been banned in a number of countries. The dough for white bread, rolls, buns and similar products consists of flour, water, yeast, salt and possibly other ingredients such as sugar and fat. Flour consists of gluten, starch, non-starch polysaccharides, lipids and trace amounts of minerals. As soon as the dough is made, the yeast starts to work on the fermentable sugars, transforming them into alcohol and carbon dioxide, which makes the dough rise. The main component of wheat flour is starch. Amylases can degrade starch and produce small dextrins for the yeast to act upon. There is also a special type of amylase that modifies starch during baking to give a significant anti-staling effect. Gluten is a combination of proteins that forms a large network during dough formation. This network holds the gas in during dough proofing and baking. The strength of this gluten network is therefore extremely important for the quality of all bread raised using yeast.

ENZYMATIC BREAD IMPROVERS SEBake SW SERIES - A COMPLETE REPLACEMENT FOR POTASSIUM BROMATE (CARCINOGEN)

For a long time, amylase was thought to be the only enzyme that could be used in the milling industry. This view has changed drastically since the introduction of bread improvers in the market. Bread improvers are nothing but a specially designed premix for preparing bread. Previously, cancer causing chemicals such as potassium bromate were used as a strengthener for bread. As technology advances day by day, Advanced Enzymes Technologies Ltd., has come up with the complete bromate replacing bread improver known as the SEBake SW Series of bread improvers. SEBake SW, when used in recipes gives the bread a golden crust colour, finer, whiter crumbs, finer texture, softness, higher volume and increased shelf life. The SEBake SW Series of bread improvers with specially designed pentosans not only improves gas retention, but also hinders the formation of the gluten network that retains the carbon dioxide gas in the dough. The hemicellulases that facilitates the water uptake reduces stiffness and results in softer breads.

ENZYMATIC BISCUIT IMPROVERS AS A COMPLETE REPLACEMENT FOR SODIUM META BI-SULPHITE REPLACER (CARCINOGEN)

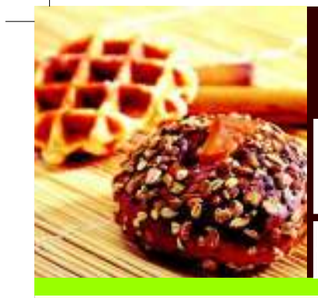
Enzymes are being used in biscuits, crackers and cookies. Mainly hydrolytic enzymes such as protease and specially designed pentosans type of enzymes are used in biscuits.

In the glucose type of biscuits, the fermented variety of biscuits usually uses Sodium Meta Bi-Sulphite as a strong reducing agent for splitting the inert and intra disulphide bonds of gluten, causing the dough to fall. Since it destroys the Vitamin B1 and is also found to be a long-term effective carcinogen, we at Advanced Enzymes Technologies Ltd. have developed a biscuit improver which acts as a complete replacement for Sodium Meta Bi-sulphite in the glucose type of biscuits. It not has health benefits, but also reduces baking time, thus saving energy. Since protease takes away the internal tension, it makes the biscuit flat at the bottom and helps in uniform colour development . It also aids in giving a better shine and finished texture as well as proper browning to the baked biscuits. In the case of the fermented type of biscuit; biscuit improvers not only enhance the characteristics of the biscuit but they also reduce fermentation time.

CAKE IMPROVER

SEBake cake improver is a ready-to-use improver that can be whisked together with other ingredients, thereby reducing the mixing time and also increasing batter resistance to mechanical handling before baking. It is designed to produce superior quality cakes that are better tasting, softer, whiter and spongier with increased volume.

Saylee Pradhan
Manager - Non Pharma Application Development
Advanced Enzymes



Baking Report

Test Area: AETL Laboratory
No. 1: AETL SEBake-GO **(20 PPM)**
No. 2: Competition 1 (25 PPM)

PRODUCT PROCESSING

Quantity	**No. 1**	**No. 2**
Flour Weight (g)	1000	1000
Water (%)	61	61
Compressed Yeast (%) (from AB MAURI company)	3	3
Salt (%)	1.5	1.5

TEMPERATURE

Room Temperature (°C)	32.0	32.0
Flour Temperature (°C)	30.2	30.2
Water Temperature (°C)	10.5	10.5
Dough Temperature (°C)	29.0	29.0

PROCESS

Kneading (slow+fast)	(3+10)	(3+10)
Dough Resting Time (min)	11	11
Dough Cutting Weight (gm)	440	440
Proofing Time (min)	90 -100	90 -100
Oven Temperature (°C)	240	240
Baking Time (min)	20	20

DOUGH PROPERTIES	**Standard**	**No. 1**	**No. 2**
Tightness	+ + +	+ + +	+ + +
Stickiness	-	-	-
Stability	+ + + + +	+ + + + +	+ + + + +

BREAD QUALITY	**Standard**	**No. 1**	**No. 2**
Bread Volume	* * * * *	* * * *	* * * * *
Crust Colour*	* * * * *	* * * * *	* * * * *
Pore Structure	* * * * *	* * * * *	* * * * *
Crumb Elasticity	* * * * *	* * * * *	* * * * *

HUNTER LAB COLORIMETERIC READING FOR CRUMB COLOUR

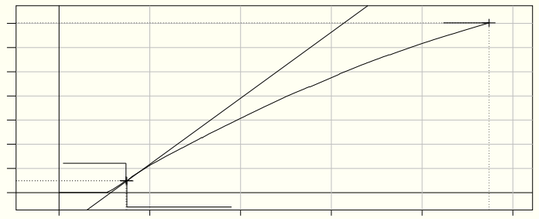
	No. 1	**No. 2**
L Value	61.44	61.45
a Value	0.24	0.25
b Value	13.12	13.22

L equals 0-100 (0=black and 100=white)
a equals red to green (+ = red and - = green)
b equals yellow to blue (+ = yellow and - = blue)

SOFTNESS OF BREAD BY TEXTURE ANALYSER TA PLUS (LLYODS)

	No. 1	**No. 2**
Test Speed (mm/min)	50	50
Test Parameter	Preload No Stop at 20 mm	Preload No Stop at 20 mm
Firmness (N)	8.43	8.41
Deflection At Maximum Load (mm)	20.011 mm	20.011 mm

More the firmness value, more hard the bread is. Lower the firmness value, more soft the bread is.



Softness Through Texture Analyser

REPORT ON BAKERY PRODUCT

Advanced Enzymes Technologies Ltd.
SEBake LBG: 2 TO 5 GM / 90 KG

Competitor Product:
Competition 1 : 1 TO 3 GM / 90 KG

Bread Trial Report

CHARACTERISTICS OF BREAD OBTAINED

Bread	Texture	Crumb Colour	Softness	Crust Colour	Crust Colour	Overall Score (out of 50)
SEBake LBG	8	8	7	8	8	39
Competition	8	8	8	8	7	738

10-20 - poor
20-30 - good
30-40 - excellent

HUNTER LAB REPORT FOR BREAD WHITENESS

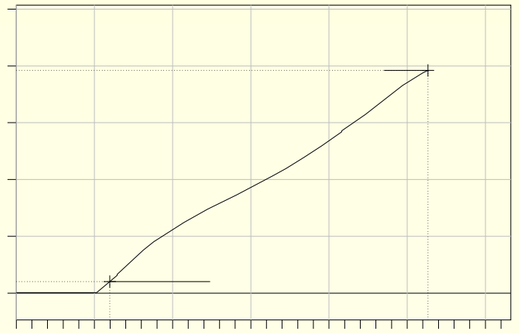
Bread	L Value	a Value	b Value
SEBake LBG	69.99	2.54	11.13
Competition 1	68.12	2.78	11.52

L equals 0-100 (0=black and 100=white)
a equals red to green (+ = red and - = green)
b equals yellow to blue (+ = yellow and - = blue)

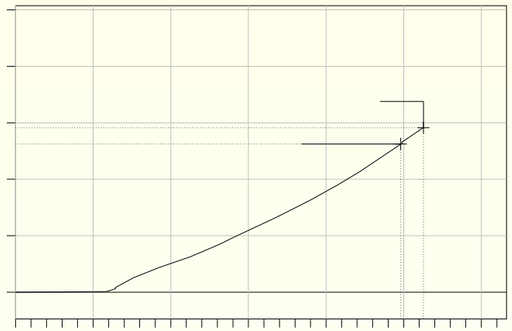
SOFTNESS REPORT

Sample Information	Loaf Bread	Loaf Bread
Batch Reference	Competition 1	SEBake LBG
Speed	50 mm/min	50 mm/min
Firmness	3.36	3.05
Deflection At Maximum Load	20.011	20.011

Lower the firmness value, more soft the bread is. Higher the firmness value, more hard the bread is.



Competition 1 - Bread Softness

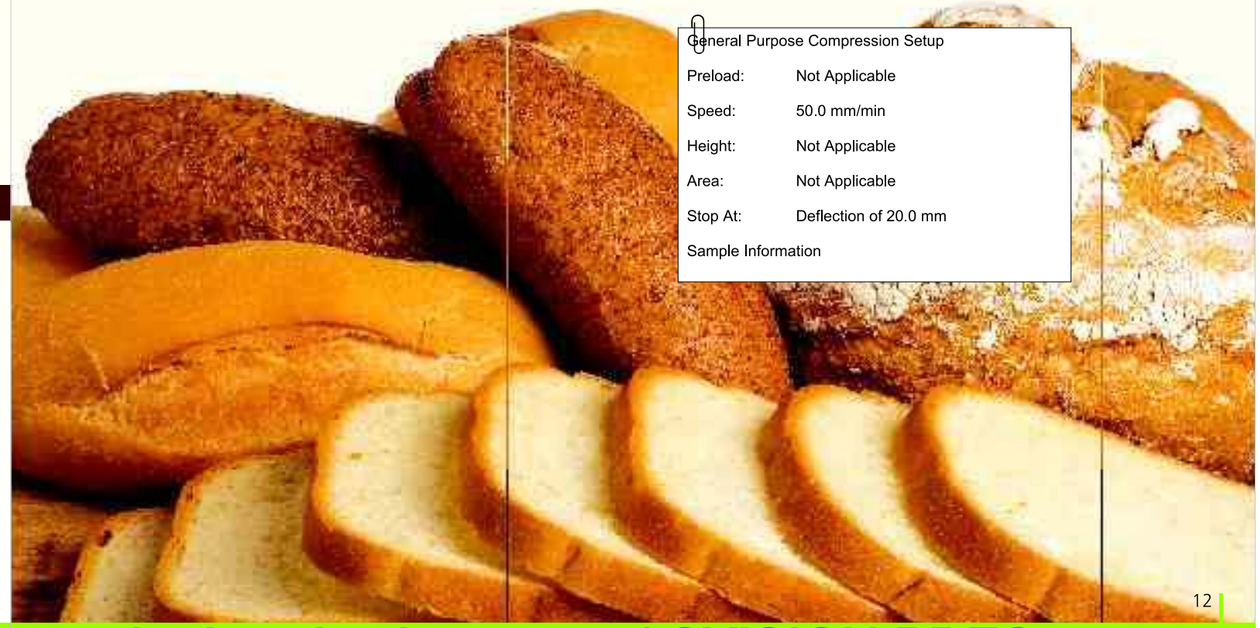


General Purpose Compression Setup

Preload:	Not Applicable
Speed:	50.0 mm/min
Height:	Not Applicable
Area:	Not Applicable
Stop At:	Deflection of 20.0 mm

Sample Information

SEBake LBG - Bread Softness



General Purpose Compression Setup

Preload:	Not Applicable
Speed:	50.0 mm/min
Height:	Not Applicable
Area:	Not Applicable
Stop At:	Deflection of 20.0 mm

Sample Information

REPORT ON TECHNOLOGY BREAD IMPROVER

SEBake SW 75 (AETL): 40 to 50 gm / 90 kg
Competition 1: 50 to 100 gm / 90 kg
Competition 2: 40 to 50 gm / 90 kg

CHARACTERISTICS OF BREAD OBTAINED

Bread	Texture	Crumb Colour	Softness	Crust Colour	Crust Colour	Overall Score (Out of 50)
Competition 2	8	8	8	7	8	39
SEBake SW 75	8	8	8	8	8	40
Competition 1	8	8	7	8	8	39

10-20 - poor
20-30 - good
30-40 - excellent

HUNTER LAB REPORT FOR BREAD WHITENESS

Bread	L Value	a Value	b Value
Competition 2	69.18	3.89	12.98
SEBake SW 75	71.10	3.98	11.43
Competition 1	69.10	3.33	12.99

L equals 0-100 (0=black and 100=white)
a equals red to green (+ = red and - = green)
b equals yellow to blue (+ = yellow and - = blue)

SOFTNESS REPORT

Sample Information	Loaf Bread	Loaf Bread	Loaf Bread
Batch Reference	Competition 2	SW 75	Competition 1
Speed	50 mm/min	50 mm/min	50 mm/min
Firmness	3.02	2.3468	3.834
Deflection At Maximum Load	20.011	20.011	20.011

Lower the firmness value, more soft the bread is. Higher the firmness value, more hard the bread is.

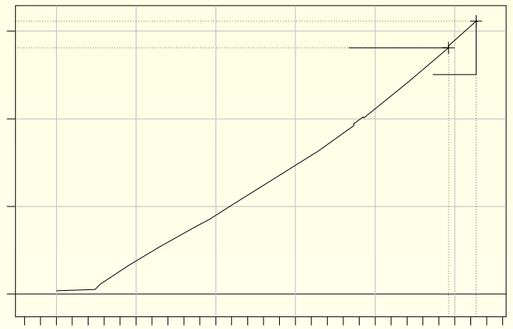
SEBake SW 300

SEBake SW 1000

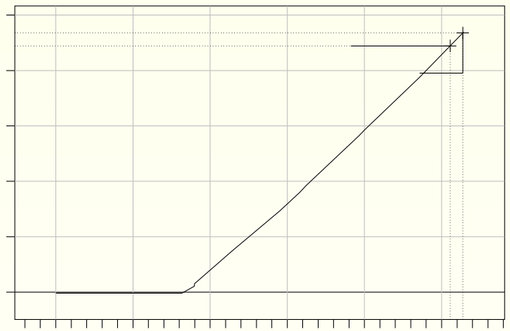
SEBake PV

SEBake SW 500

Softness Measurement: Llyods Texture Analyser TA Plus



Competition 2 - Bread Softness



General Purpose Compression Setup

Preload: Not Applicable

Speed: 50.0 mm/min

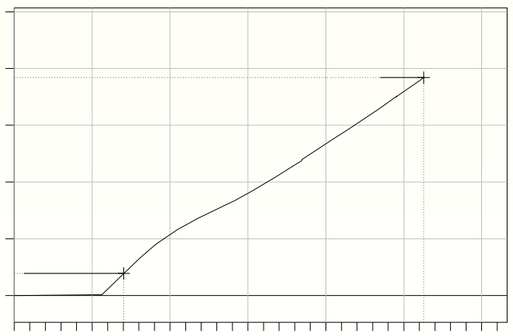
Height: Not Applicable

Area: NotApplicable

Stop At: Deflection of 20.0 mm

LOAF

SW 75 - Bread Softness



General Purpose Compression Setup

Preload: Not Applicable

Speed: 50.0 mm/min

Height: Not Applicable

Area: Not Applicable

Stop At: Deflection of 20.0 mm

LOAF

Baking Report

Date: 2/3/2007

Test Area: AETL Laboratory

No. 1: AETL SEBamyl 3400 G (12 PPM)

No. 2: Competition 1 (15 PPM)

PRODUCT PROCESSING

Quantity	No. 1	No. 2
Flour Weight (g)	1000	1000
Water (%)	61	61
Compressed Yeast (%) (from AB MAURI company)	3	3
Salt (%)	1.5	1.5

TEMPERATURE

Room Temperature (°C)	32.0	32.0
Flour Temperature (°C)	30.2	30.2
Water Temperature (°C)	10.5	10.5
Dough Temperature (°C)	29.0	29.0

PROCESS

Kneading (slow+fast)	(3+10)	(3+10)
Dough Resting Time (min)	11	11
Dough Cutting Weight (gm)	440	440
Proofing Time (min)	90 -100	90 -100
Oven Temperature (°C)	240	240
Baking Time (min)	20	20

DOUGH PROPERTIES	Standard	No. 1	No. 2
Tightness	+ + +	+ + +	+ + +
Stickiness	-	-	-
Stability	+ + + + +	+ + + + +	+ + + + +

BREAD QUALITY	Standard	No. 1	No. 2
Bread Volume	* * * * *	* * * * *	* * * * *
Crust Colour	* * * * *	* * * * *	* * * * *
Pore Structure	* * * * *	* * * * *	* * * * *
Crumb Elasticity	* * * * *	* * * * *	* * * * *

HUNTER LAB COLORIMETERIC READING FOR CRUMB COLOUR

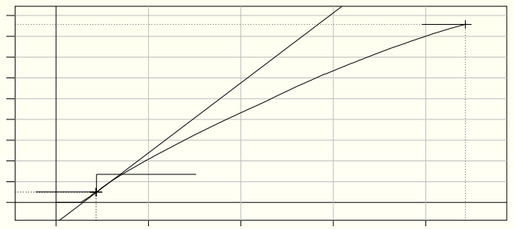
	No. 1	No. 2
L Value	61.44	61.45
a Value	0.24	0.25
b Value	13.12	13.22

L equals 0-100 (0=black and 100=white)
a equals red to green (+ = red and - = green)
b equals yellow to blue (+ = yellow and - = blue)

SOFTNESS OF BREAD BY TEXTURE ANALYSER TA PLUS (LLYODS)

	No. 1	No. 2
Test Speed (mm/min)	50	50
Test Parameter	Preload No	Preload No
	Stop at 20 mm	Stop at 20 mm
Firmness (N)	8.43	8.41
Deflection At Maximum Load (mm)	20.011 mm	20.011 mm

More the firmness value, more hard the bread is. Lower the firmness value, more soft the bread is.



Softness Through Texture Analyser

General Purpose Compression Setup

Preload:	0.500 N
Speed:	50.0 mm/min
Height:	Not Applicable
Area:	Not Applicable
Stop At:	Deflection of 20.0 mm
Sample Information	

Comparison Results Of AETL Products:
SEBake SW 200

Quiz

Enzyme Practice Quiz - Living Environment

1. **Which chemical is classified as an enzyme?**
   (1) Galactose (2) Lipid
   (3) Protease (4) Manganese Dioxide

2. **Which element is present in maltase, but not in maltose?**
   (1) Carbon (2) Hydrogen
   (3) Oxygen (4) Nitrogen

3. **In enzyme controlled reactions, the role of certain vitamins such as niacin is to act as...**
   (1) an enzyme (2) a substrate
   (3) a coenzyme (4) a polypeptide

4. **Salivary amylase is an enzyme in humans that breaks down starch. The optimum pH for this reaction is** 6.7. The rate of this reaction would not be affected by...
   (1) maintaining the pH of the reaction at 6.7
   (2) substrate concentration
   (3) enzyme concentration
   (4) decreasing the temperature of the reaction by 5°C

5. **A certain enzyme will hydrolyze egg white but not starch. Which statement best explains this observation?**
   (1) Starch molecules are too large to be hydrolyzed.
   (2) Enzyme molecules are specific in their actions.
   (3) Egg white acts as a coenzyme for hydrolysis.
   (4) Starch is composed of amino acids

6. **Which environmental condition would most likely have the LEAST effect on the rate of enzyme controlled hydrolytic reactions in humans?**
   (1) The pH of the solution
   (2) the temperature of the solution
   (3) the amount of enzyme present
   (4) the amount of light present

7. **Lipase, maltase and protease are members of a group of catalysts known as...**
   (1) hormones (2) carbohydrates
   (3) lipids (4) enzymes

8. **The fact that amylase in the human small intestine works best at normal body temperature suggests that...**
   (1) amylase is denatured at temperatures below 37°C
   (2) amylase can function only in the small intestine
   (3) the lock-and-key model of enzyme action does not apply to amylase
   (4) the optimum temperature for amylase is 37°C

9. **Letter A in chemical reaction one most likely represents...**
   (1) a substrate (2) a neurotransmitter
   (3) a hormone (4) an organic catalyst

10. **Which substance most likely represents Letter C in reaction two?**
    (1) Amylase (2) Protease
    (3) Sucrase (4) Lipase

The Winner Of The Last Quiz
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