Bread Improver: Enzyme active malt with Vitamin C

Malt is sprouted grain that has been dried. If the drying is with gentle heat, there is little or no loss of the bioactive compounds and enzymes that develop during the sprouting process, which generally is 3-4 days. Enzyme active malt flour can be purchased under the name *diastatic malt*, or made at home. See method at www.wholegrainconnection.org .

Enzyme active malt as its name suggests provides a good supply of the enzymes associated with the sprouting grain. Included are amylase, phytase, pentosanase, peptidase, lipase, and oxidase, which respectively release sugar from starch, minerals from phytate, soluble pentosans (arabinoxylans) from the fiber in cell walls, modify protein, hydrolyze fats to their constituent fatty acids, and oxidize unsaturated fatty acids. This is a highly simplified overview of the vast array of enzyme activity in the sprouting grain. The products are valuable as nutrients for the sourdough microorganisms, and for the modification of the textures of the gluten, starch and dietary fiber in dough.

When wheat is grown through a very dry summer; it generally contains 10% moisture or less and so the enzyme system is dormant. The addition of enzyme active malt to dough, supplies enzymes to work on the flour during the early stages of dough hydration. Later when the dough is fully hydrated the natural enzyme activity of the flour comes into play. In the sourdough system, by the time the dough is baked, enough acidity develops to prevent the amylases from excessively breaking down starch and liquefying the dough during baking. However there is still much to learn about the effect of enzyme active malt in the sourdough system.

The exact role of anti-oxidant vitamin C (ascorbic acid) in bread-making is unknown, although there is some evidence for increased crosslinking between the sulfur-containing amino acids in gluten. The result is a stronger cell structure in the dough and final bread. Hearth loaves are less likely to spread in the oven and have increased volume. Pocket breads seem better able to pocket than in the absence of the vitamin C.

Conventionally, vitamin C is used in dough at a level of 75 – 100 ppm in the final dough. Vitamin C crystals, without additives of any kind, can generally be purchased in health food stores. Enzyme active malt is used at 1 percent or less with respect to the flour. A convenient way to measure out these tiny amounts of vitamin C, is to mix it with a known amount of enzyme active malt, so that when the enzyme-active malt is added to the flour at the 1% level there will be 100 – 150 ppm vitamin C in the dough. These amounts allow for some losses during storage and for the use of less than 1% enzyme active malt

Making the enzyme-active malt and vitamin C bread improver:

Ingredient	*Grams**	*Ounces**
Enzyme active wheat malt**	100	4
Vitamin C crystals	2	0.08

** These are convenient and common units, they are not equal amounts; 100 grams is less than 4 ounces (= 113 grams).*
*** See separate recipes at www.wholegrainconnection.org*

[] Very thoroughly mix these two ingredients in a bowl.
[] Transfer the mixture to a glass jar with a tight fitting screw cap. Store at room temperature, below 75ºF (24ºC). *The mixture seems to keep its potency for at least 6 months when stored this way.*