Collapse

Assuming you have good flour (some enzyme activity & starch damage, not too much), and a healthy sourdough culture, rye most often collapses because of:

- UNDERFERMENTATION – the dough isn't acidic enough to inhibit enzyme activity. As the dough warms in the oven, the rate of amylase driven starch breakdown picks up. Too much starch breakdown and the dough loses its structural integrity.
- OVERFERMENTATION – the dough is too acidic. The rate of pentosanase activity picks up, decreasing the dough's viscosity. The surface of the loaf visibly breaks down, with widening cracks and bubbles. The dough feels slack and fragile when pressed. Eventually, it begins to sag.
- OVERHYDRATION – The dough is loose and unshapable. It feels overfermented before the final fermentation has begun. It may survive as a flat hearth loaf, but it's too weak to hold up its own weight in a tin.

Mix

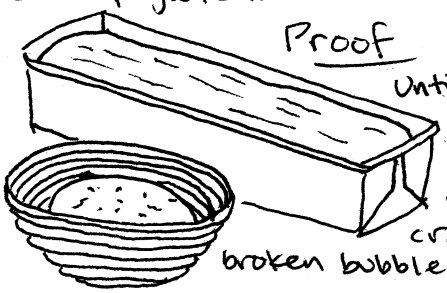
Whether you're mixing by hand or machine, fully mixed rye dough should flow. "Flow" feels different than the extensibility of a wheat dough. It's closer to the feeling of clay when you pull a handle. If the dough doesn't feel right, try:

Adding water, increasing mix time, scalding some of the flour to increase amylase activity, or adding malt to increase amylase activity.

Bulk

Not really necessary because rye doesn't develop gluten.

Proof



Until the dough is expanded and beginning to weaken, showing cracks and broken bubbles on the surface.

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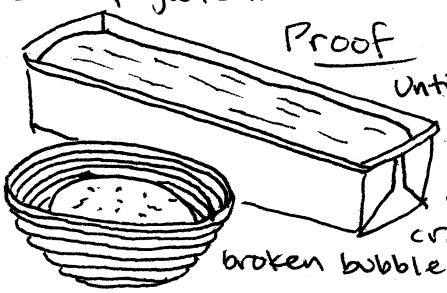

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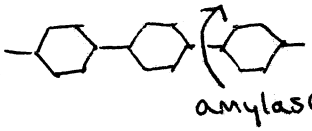
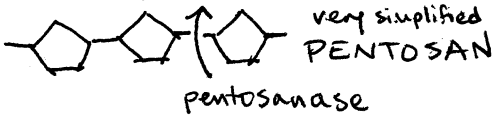
Enzymes

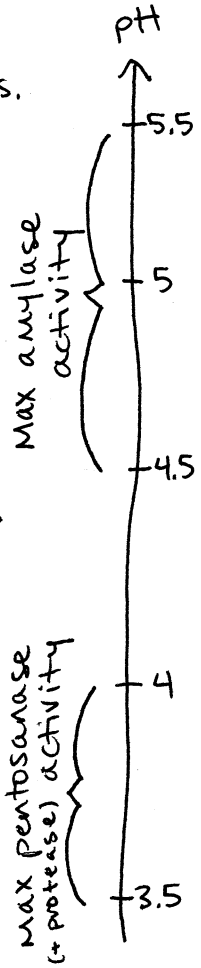
Rye has very active enzymes. Proper fermentation controls enzyme activity.

Under acidified dough will suffer the dreaded "STARCH ATTACK" in the oven, as amylase enzymes break starches down into sugars, causing the inside of the loaf to collapse.

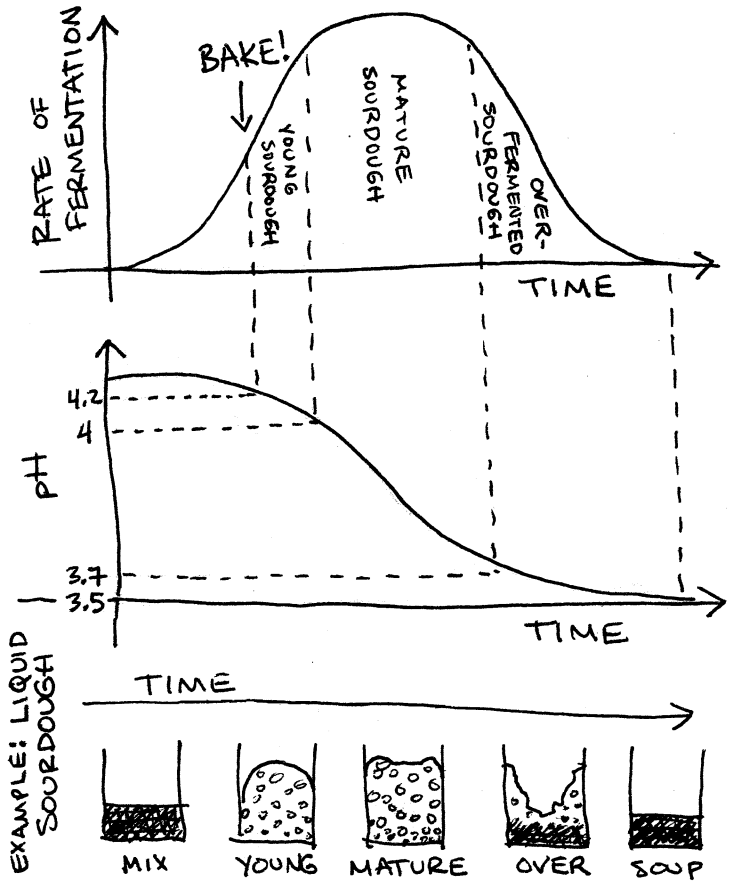


In dough that's too acidic, PENTOSANASE will break down pentosans. The dough will lose its viscosity and collapse (but overfermentation is easy to spot before you bake.)





Fermentation



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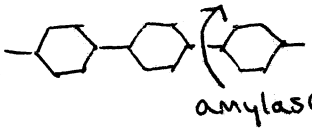

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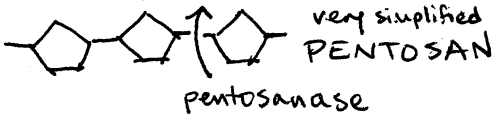

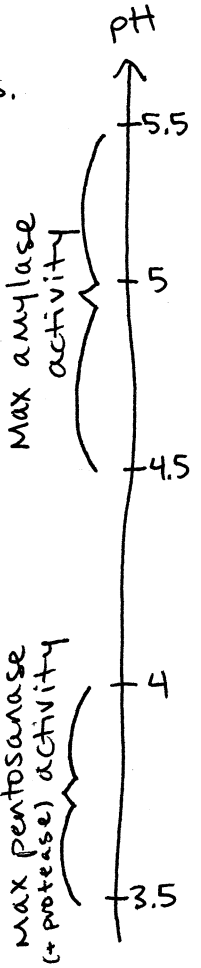

Fermentation