Interrest of using inactive yeast as flour corrector

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Definition

- Inactive yeast :
  dead yeast without fermentative power.
  - Killed by heating
  - Rich in glutathion (GSH) produced by the cell

Focus on wheat protein

- Wheat protein : mainly gluten
  - soluble protein : albumin and globulin
  - insoluble protein : gliadin and glutenin
- Flour with high gliadin level :
  - Good extensibility, good developement, but lack of tolerance
- Flour with high glutenin level :
  - Lack of extensiblity, excess of elasticity, lack of development

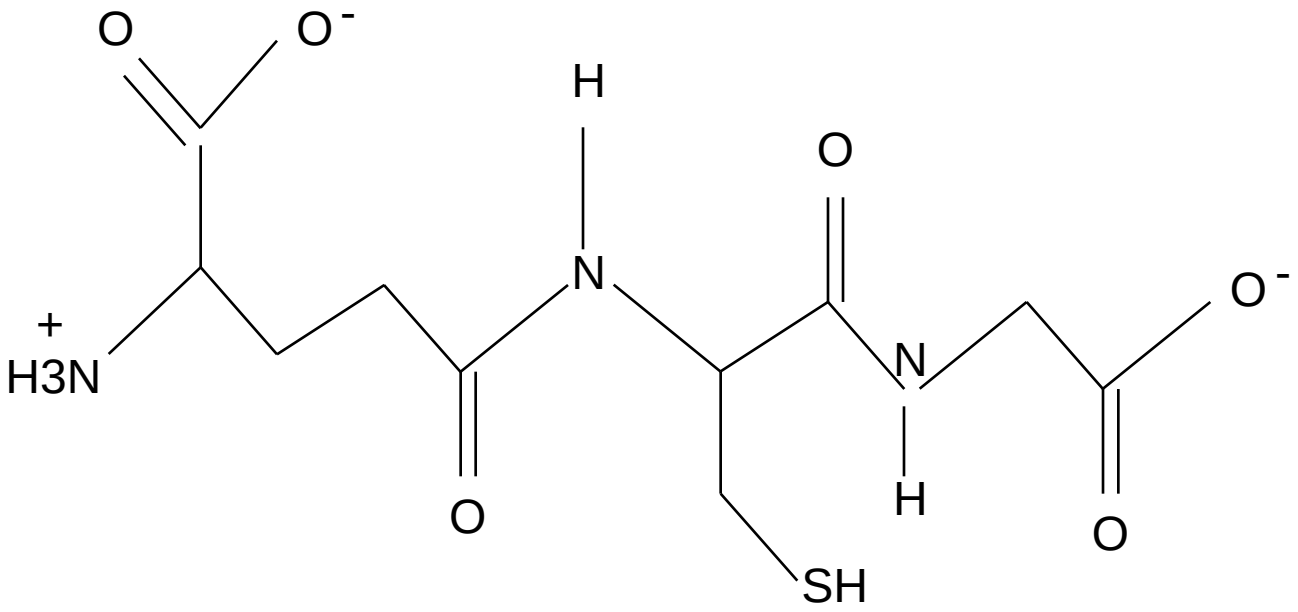
$\Rightarrow$ Balanced flour : ratio glutenin / gliadin = 1/3

Correcting high elasticity dough

- Using reducing agent
  - Inactive yeast
  - L cystein
  - Proteolytic enzymes

Inactive yeast

- Active molecule : glutathion
- Tripeptides with thiols
  γ-glutamyl-cysteinyl-glycine



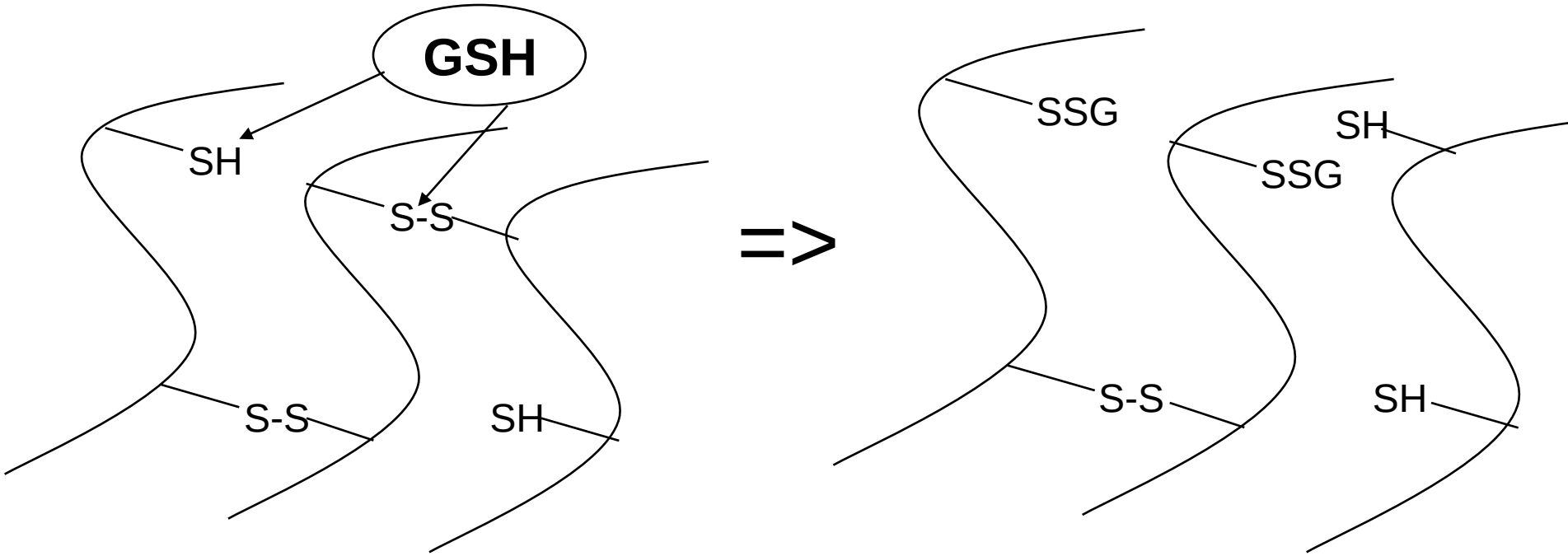
Inactive yeast

- Glutathion has no effect in living yeast cell
  BUT
  when it is released through oriented drying process
  => strong reducing agent on the gluten

- Glutathion will react with oxydising agent to create
  - Oxydised form : GSSG
  - Reduced form : GSH => interrest as reducing agent

Action of inactive yeast

- Will create di-sulfure bridge with others thiols available



Using inactive yeast : Dough becomes less elastic and more extensible

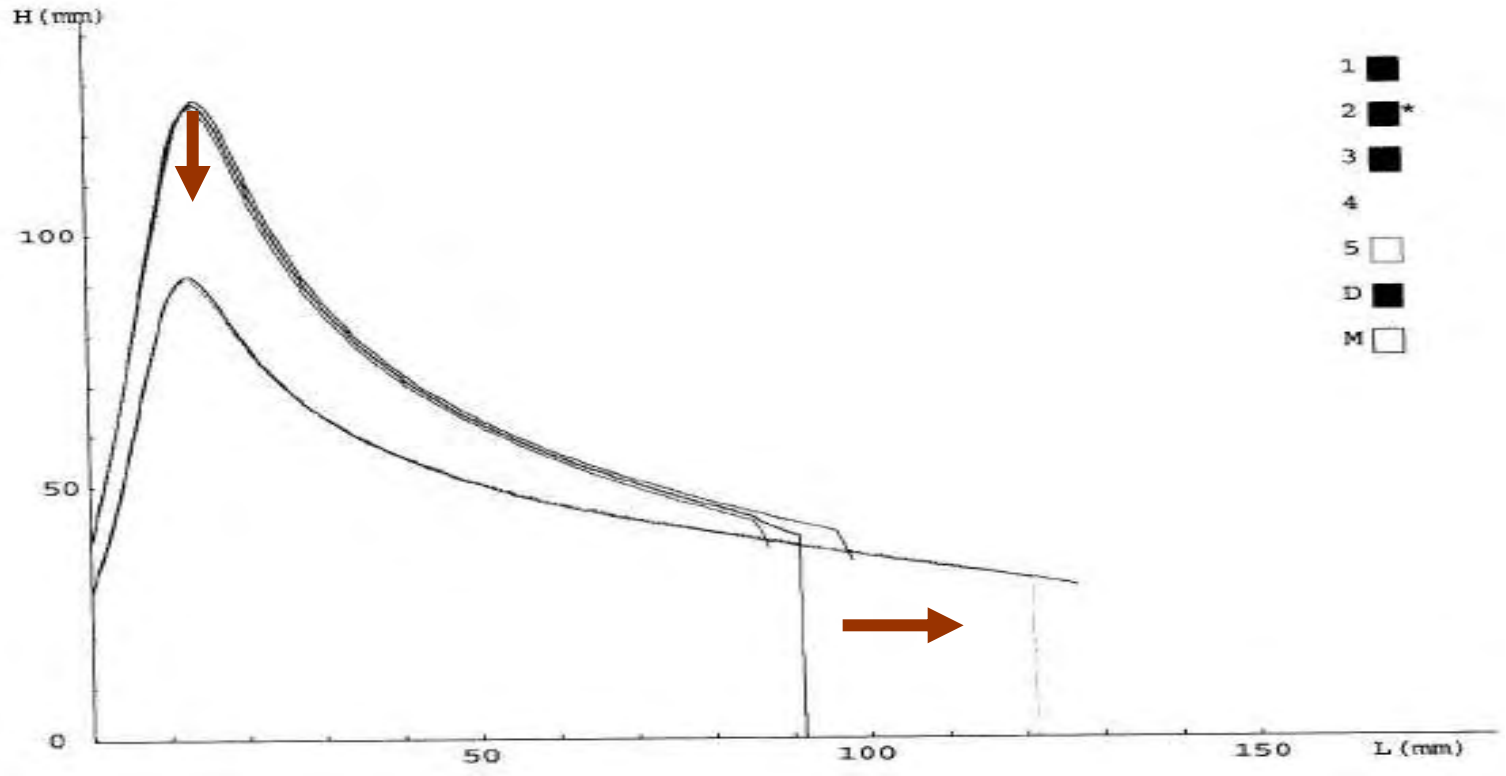
Inactive yeast performance

- Performance of inactive yeast as reducing agent is mesured by GSH concentration :

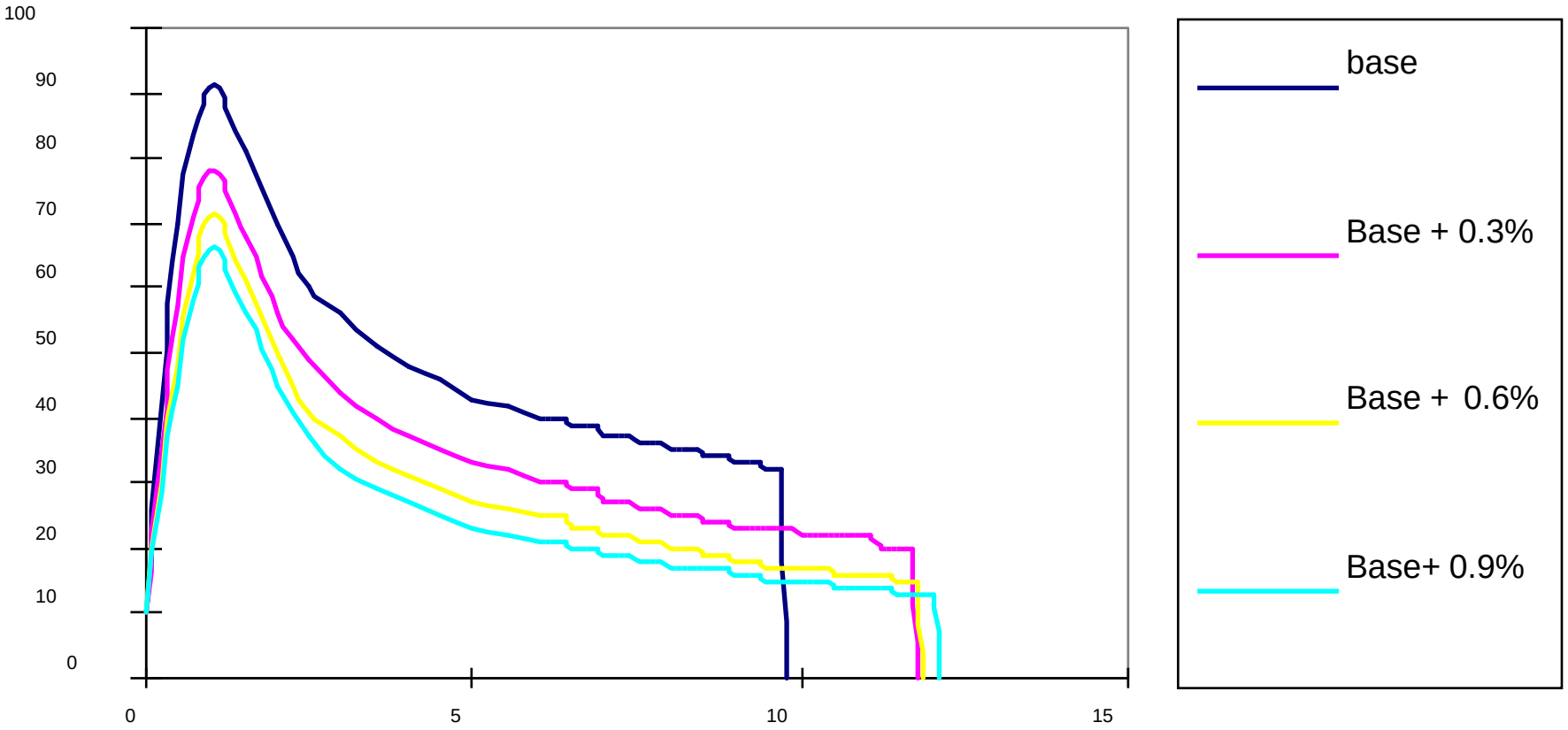
- Different sort of inactive yeast :
  - Standard : max 0,5% GSH
  - Enriched in GSH : 1,5 – 2% GSH
  - High level in GSH : 2,5 – 3,5% GSH

Effect on alveographic curve

Reduce P/L ratio



Effect of inactive yeast



Effect on dough/bread process

Decreasing dough resistance

- Quicker smoothing during mixing
- Decreasing strength during bulk fermentation
- During dividing : better homogeneity
- Decreasing resting time
- Decreasing shrinking effect
- Better tolerance

Improving bread aspect

- Bigger volume
- More regular shape

Others products with similar effect

- L cystein :
  - Lower price
  - High risk of overdosage
  - Instant full effect
  - Must be declared additif E 920

- Proteolytic enzymes :
  - Very high risk of overdosage
  - Risk of proteolyse

Labelling

- Inactive yeast
  - Declared as yeast
  - No E number : clean label
- L cystein
  - E 920
  - Extraction from human hair
  - Extraction from poultry feathers

Conclusion

- For wheat with too high P/L ratio using a reducing agent will improve greatly flour and bread characteristics
- 3 main reducing agents are currently available : inactive yeast, L cystein, protease
- Inactive yeast offers the best compromise for price, performance and security
- As any active ingredient use and dosage must be managed by specialists