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The Role of Salt in Food Manufacture



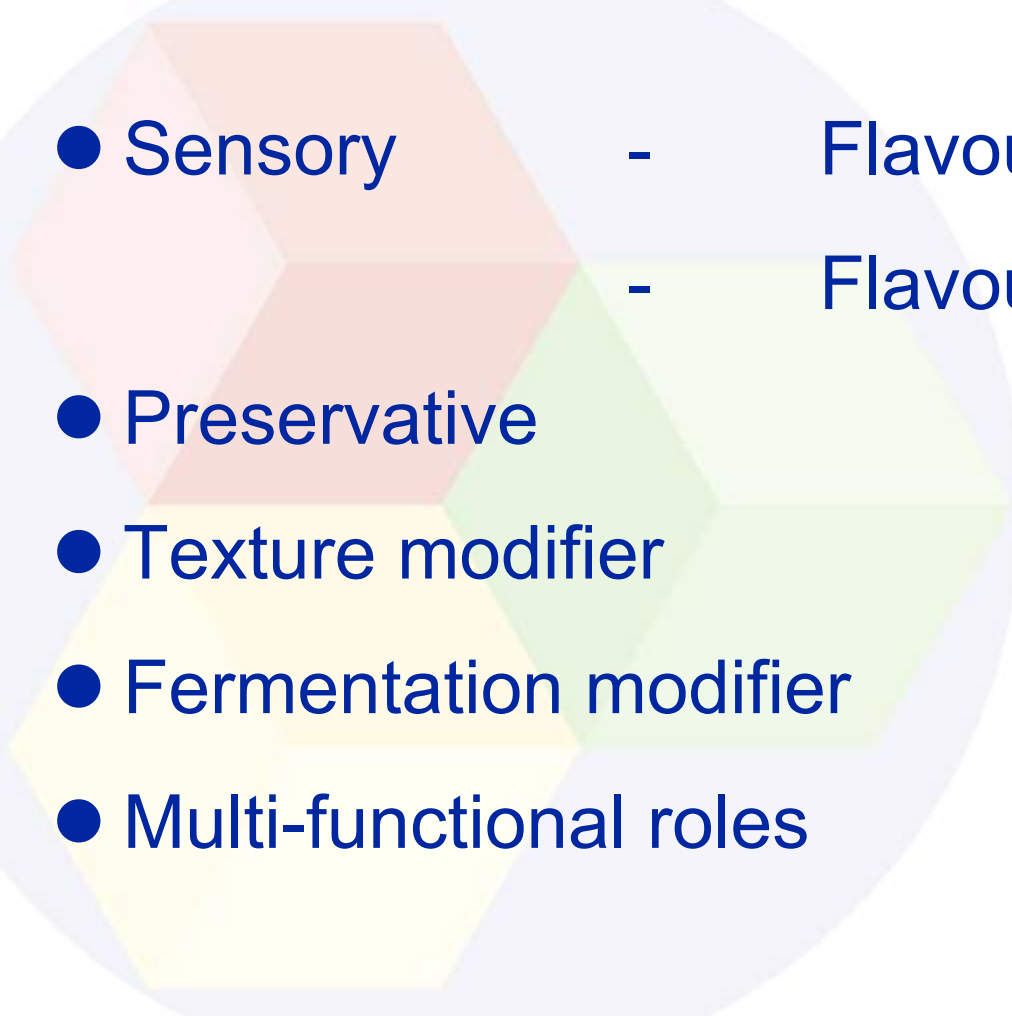
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Technological Functions of Salt

- 
- Sensory
 - Flavour
 - Flavour enhancer
 - Preservative
 - Texture modifier
 - Fermentation modifier
 - Multi-functional roles



Sensory Properties of Salt

1. Flavour

- Salt is a flavour in its own right
- Relatively narrow range of acceptability
- Important in:
 - Baked goods (Bread, Biscuits, etc.)
 - Breakfast cereals
 - Cheese
 - Meat Products
 - Even some sweet products e.g. Meringues



Sensory Properties of Salt

2. Flavour Enhancer

- Salt enhances other food flavours
- Often mixed with other flavouring ingredients e.g. spices, flavouring preparations
- Also masks undesirable flavours



Preservative Action of Salt

- Used to preserve food for thousands of years, especially meat and fish
- Reduces water activity in food
- Depends on salt concentration in water phase rather than the total product
- Inhibits microbial growth in combination with pH and temperature



Use of Salt as a Preservative

Examples:

- Meat Products,
- Fish Products,
- Cheese,
- Butter,
- Preserved Vegetables

Salt is often used in combination with other preservatives,

e.g. nitrite in meat products; particularly important in controlling *Clostridium botulinum*



Salt as a Texture Modifier

- Salt has a 'toughening' effect on food texture
- Increases ionic strength, enhances ionic bonding between components and reduces inter-particle distances

- Examples:

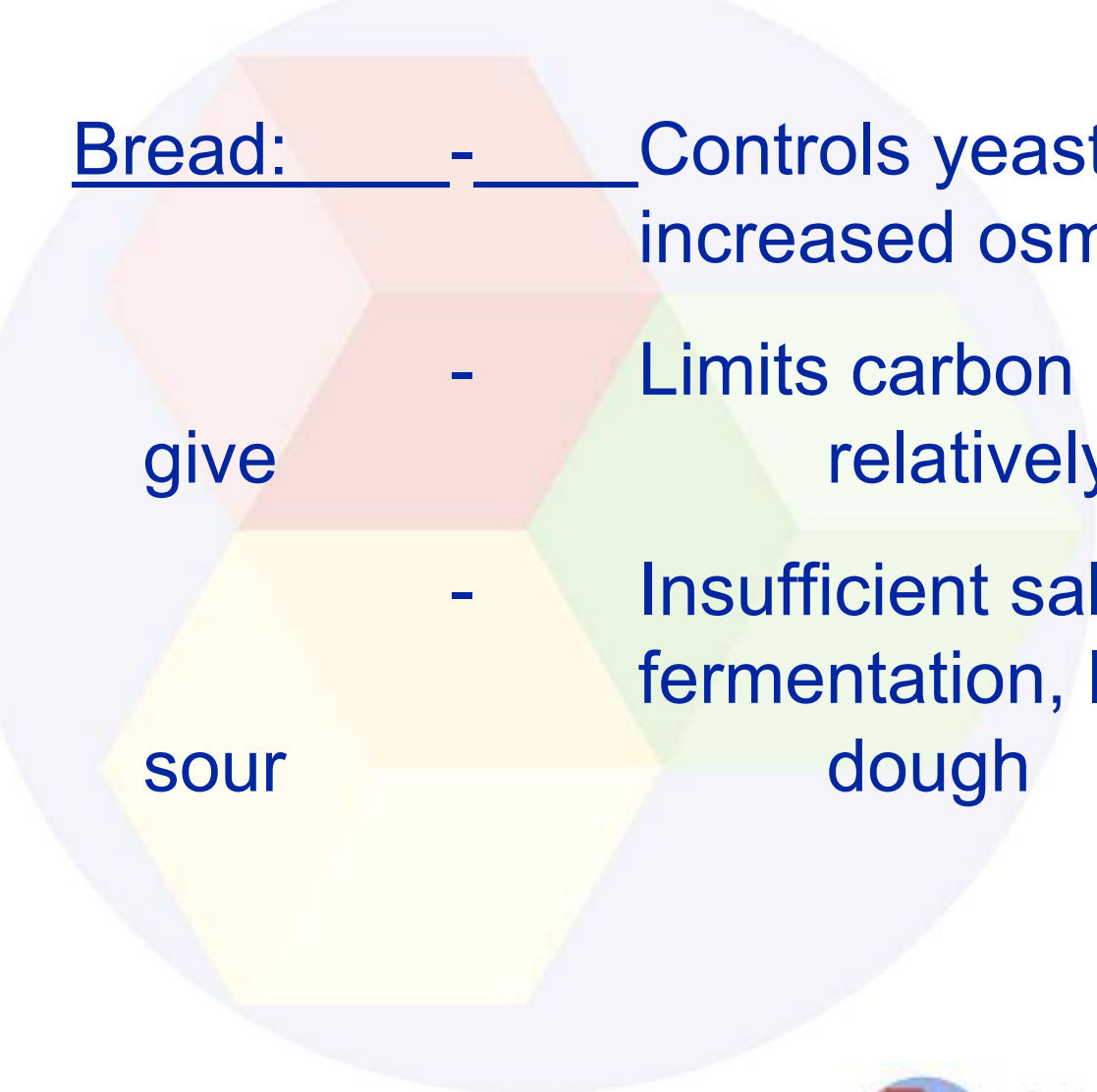
- **Meat Products:** Solubilises proteins to improve binding;
Prevents drying;
Increases succulence

- **Cheese:** Salting influences the final texture
by reducing water content and
rate of ripening

- **Pickled Vegetables:** As well as being essential for
salt increases
preservation,
crispness e.g. pickled onions,
sauerkraut



Salt as a Fermentation Modifier

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- Bread: - Controls yeast fermentation via increased osmotic pressure
- give - Limits carbon dioxide production to relatively small gas cells
- sour - Insufficient salt gives excessive fermentation, large gas cells and dough



Salt as a Fermentation Modifier

Vegetables: Limits growth of undesirable organisms while allowing fermentation by desirable ones, e.g. sauerkraut, pickles, sauce soya

Sausages: Similar principles apply



Salt as a Fermentation Modifier

Cheese: _____ - _____ Salt is used to control the starter culture activity and the pH

1%

- Starter culture requires around salt or less

salt

- Growth is inhibited at 2.5 - 3%

undesirable
thus quite narrow

- Narrow range for optimum growth and exclusion of organisms is



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Salt as a Multifunctional Ingredient

- Salt rarely performs only one function
- As well as flavour and preservative effect, it performs a variety of technological functions in different products
- Examples:
 - Bread
 - Cheese
 - Meat products



Salt as a Multifunctional Ingredient

Bread

- Control of yeast to optimise fermentation
- Stabilises gluten and reduces elasticity
- Increased salt content increases mixing time and energy input
- European breads require salt; unleavened breads, e.g. chapatis, contain no salt



Salt as a Multifunctional Ingredient

Cheese

- Fermentation
- Texture
- Preservative
- Flavouring:
 - Assists enzyme activity involved in flavour development
 - Prevents bitterness through reduction of casein hydrolysis
- External application to produce hard rind.

The range of salt levels across European cheeses reflects the many combinations of these various effects needed to create the characteristic physical and organoleptic properties



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Salt as a Multifunctional Ingredient

Meat Products

- Texture (succulence/toughness)
- Fermentation
- Flavour
- Colour
- Preservative:
 - Salt itself
 - In combination e.g. nitrite, sulphur dioxide in

British Sausages



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