

Dried Milk Particle Properties

LPT- 610

Unit 1

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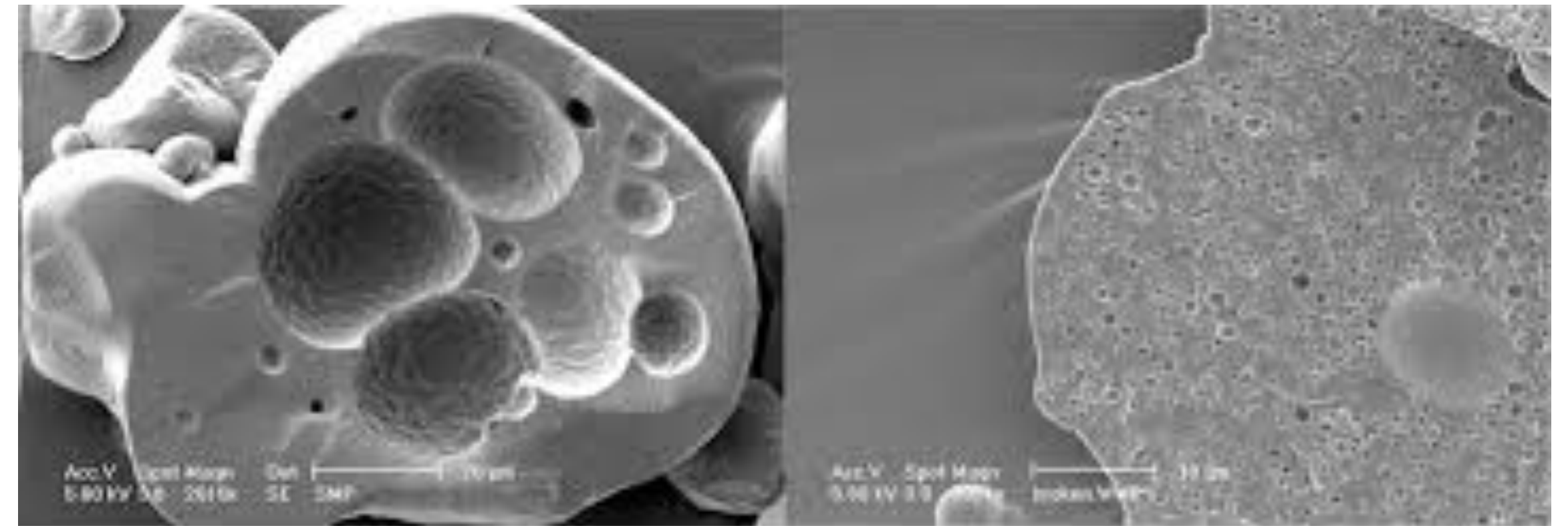
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Structure of Dried Milk Particle

1. Primary Structure

2. Secondary Structure



(a) skim milk particle

(b) whole milk particle



Structure

(factors affecting the structure of dried milk powder particle)

State of Lactose

State of Protein

State of Fat

Moisture Content

Density

(Types)

Bulk/Apparent Density

Particle Density

True Density

Densities of Dried Milk

Category	Approximate Density (g/ml)
1. Uncompressed Drum Powder:	0.3-0.5
2. Uncompressed Pressure Spray Powder:	0.5-0.6
3. Compressed Drum and spray Powder:	1.1-1.2
4. Air-Free Whole Milk Powder:	1.31-1.32
5. Air-Free Skim Milk Powder:	1.44

(Source: Condensed Milk and Milk Powder Hunziker, 1949)

Flowability

Factors

- **Agglomeration**
- **Spherical shape**
- **High Particle Density**
- **Smooth Surface**
- **Dryness**



Other Factors

- **Milk Dustiness**
- **Reconstitutability**
 - (a) **Dispersability**
 - (b) **Wettability**
 - (c) **Sinkability**
- **Flavour**
- **Colour and Appearance**



Keeping Quality

Factors Affecting

1. Composition.
2. Quality of milk used in production.
3. Care during production.
4. Care during handling and storage.
5. Manufacturing conditions.
6. Packaging conditions.
7. Storage conditions.

Major Changes During Storage

Fat Decomposition

Lactose-Protein Changes

- Fat Decomposition - Oxidation rate and Rancidity
 - A. Storage Temperature
 - B. Presence of Cu & Fe.
 - C. Acidity.
 - D. Sunlight.
 - E. Pre-heating
 - F. Addition of anti-oxidants
 - G. Gas packing

Lactose Protein Changes

Modulated by:

1. Staleness
2. Off-colour
3. Insolubility

Drum Dried v/s Spray Dried Products

Properties

	Drum-Dried	Spray Dried
• Particle Size	8-20 micron	10-250 micron
• Surface	wrinkled	normally smooth
• Shape	regular	irregular
• Air cell	normally present	normally absent
• Bulk density	0.3-0.5	0.5-0.6
• Flowability	slightly lower than SD	slightly higher than RD
• Dustiness	slightly lower than SD	slightly higher than RD
• Reconstitutability	slightly lower than SD	slightly higher than RD
• Flavour	definitely cooked	pasteurized/cooked
• Colour	slightly darker than SD	light yellow/creamy white

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Thank you.....

Dr. Gargi Mahapatra

