Practical work 13

Standardization of Raw Material Consumption in Pasta Production

Practical Work

Objective of the Practical Work

To develop students' practical skills in standardizing and calculating raw material consumption in pasta production, including:

- determination of consumption norms for flour and water
- calculation of pasta yield
- losses during production and drying
- moisture-based recalculation
- preparation of material balance according to standards

---

1. Basic Concepts and Definitions

Raw material consumption norm – the standardized amount of raw materials required to produce a unit mass of finished pasta products.

Flour consumption (Mf) – the quantity of flour used for pasta production, kg.

Water consumption (Mw) – the quantity of water added during dough mixing, kg.

Finished pasta mass (Mp) – the mass of dried pasta products after processing.

Technological losses – losses caused by dough sticking, trimming, breakage, drying, and moisture reduction.

---

2. Key Indicators and Formulas

2.1 Pasta Yield (%)

Pasta yield = (Mp / Mf) × 100%

2.2 Raw Material Consumption per 1 ton of Pasta

Flour consumption = Mf / Mp × 1,000 kg

Water consumption = Mw / Mp × 1,000 kg

2.3 Dry Matter Calculation

Dry matter = M × (100 − W) / 100

where **W** – moisture content, %.

---

3. Practical Task 1: Standardization of Flour Consumption

Given:

To produce pasta, 1,200 kg of flour is used. The mass of finished dried pasta is 1,050 kg.

Solution:

Flour consumption per 1,000 kg of pasta:

1,200 / 1,050 × 1,000 = **1,143 kg**

Conclusion:

The standardized flour consumption is **1,143 kg per 1 ton of pasta**.

---

4. Practical Task 2: Calculation of Pasta Yield

Given:

Flour input – 900 kg.
Finished pasta output – 780 kg.

Solution:

Pasta yield = (780 / 900) × 100 = **86.7 %**

---

5. Practical Task 3: Moisture-Based Recalculation

Given:

- Flour moisture content – 14 %
- Finished pasta moisture content – 12.5 %
- Flour mass – 1,000 kg

Solution:

Dry matter in flour:
1,000 × (100 − 14) / 100 = **860 kg**

Pasta mass at 12.5 % moisture:
860 × 100 / (100 − 12.5) = **983 kg**

---

6. Practical Task 4: Material Balance in Pasta Production

Indicator	Amount (kg)
Flour input	1,200
Water added	360
Dough mass	1,560
Finished pasta	1,050
Losses and moisture removal	510
Total input = Total output	

The material balance confirms compliance with technological standards.

---

7. Independent Assignments

1. Calculate flour consumption per 1 ton of pasta if 1,500 kg of flour produces 1,320 kg of pasta.
2. Determine pasta yield if flour input is 1,100 kg and pasta output is 950 kg.
3. Flour moisture is 15 %, pasta moisture is 13 %. Calculate pasta output from 1,200 kg of flour.

---

8. Conclusion

This practical work explains how raw material consumption is standardized in pasta production. Correct standardization ensures stable product quality, reduced losses, and economic efficiency in pasta manufacturing.