

## Gluten—Hand Washing Method

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### Objective

Starch, water-soluble pentosans, and water-soluble proteins can be removed from wheat flour or semolina by manipulating a dough in water. The total wet or dry gluten is expressed as a percent of sample.

### Procedure

1. Weigh 25 g flour into porcelain cup or mortar, and add sufficient tap water to form a firm dough ball. Start with 10 ml water and gradually increase until a firm dough is developed. Hand knead dough and incorporate fines into a ball. Let dough stand in water at room temperature 20–60 min. Washing may become easier with increased soaking time. Soft wheat flours are easier to wash if soaking time does not exceed 20 min.

2. Knead dough gently in stream of tap water over bolting cloth (approximately 60GG) until starch and all soluble matter are removed. When much of the starch has been removed, the gluten ball will become darker and will take on a weblike structure. This operation generally takes 20–30 min. Use of a cloth or a U.S. 100-mesh sieve under one's hand, while washing, keeps dough from becoming loose and going into the drain, especially in the case of soft wheat. It is easier to handle soft wheat flour if NaCl is added to the wash water.

3. To determine whether gluten is approximately starch-free, let 1 or 2 drops of wash water, obtained by squeezing, fall into a beaker containing perfectly clear water. If starch is present, cloudiness appears.

4. Let gluten thus obtained by washing stand in water 1 hr, press as dry as possible between the hands, roll into a ball, place in weighted flat-bottom dish, and weigh as moist gluten.

5. Transfer to oven, dry to constant weight at 100° (24 hr), and cool.

6. Weigh as dry gluten.

### Note

Crude gluten thus obtained is not pure protein, but contains lipids, ash, and some starch.