

## The effect of NaOH on the performance of the pasteurized liquid egg white

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### Abstract

Industrial production of egg white occur many problems of bakery industry benefited from binding and foaming properties. Foaming capacity of the influx of eggs contaminated with egg yolk at different rates during the process is separated from the yellow and decreases the ability to obtain stable foam to form. Egg whites impact on the performance of literature in the some additives were investigated in this study. As a result only a portion of the contribution it made a significant change in the capacity of the foam stability of a part , particularly if used in products such as meringue, creating a very limited contribution to the performance of sugar was observed. Egg whites industry will be used in the selection of contributions that will be used by finished goods criteria for election by good analysis. NaOH on the pH it causes very high. Positive impact on all performance features, large changes in pH, pasteurization may cause difficulties because of the changes in the electrical conductivity.

**Keywords:** Bakery, egg whites, foaming, food additives, performance of egg white

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### 1. Introduction

Examples of good foaming agents generally used in the food industry are modified natural proteins of soy, casein, egg white, whey, whey protein isolate lactoglobulins, lysozyme [1-4]. Many naturally occurring proteins are too hydrophobic or too hydrophilic for good foaming properties, and so chemical or enzymatic modification of them makes them more surface active. For many proteins the rule applies that near the protein's isoelectric point the stability of the formed foam is significantly improved [5]. A foam is a colloidal dispersion in which a gaseous phase is dispersed in a liquid or solid phase. Surface, active film forming compounds, such as proteins, serve his purpose. Food foams are dependent on the surface activity and film forming properties of specific protein components [6].

Overwhipping insolubilizes too much of the ovomucin and lowers the elasticity of the bubbles [7]. The aim of this study is facing the egg whites industry, the biggest problem is yolk-white distinction, during the egg yolk with contamination as a result of decrease foam capacity and stability, to investigate the food additives that may be used for improvement.

### 2. Materials and Method

#### 2.1. Material

Pasteurized egg whites were used in the study for because of hygiene. Different properties are different batch production reference egg whites are used for each additive and at different times because of the realization of the trial, the control group showed changes as a result of egg whites. Two different

control group has been compared result for each additive.

## 2.2.Method

### 2.2.1. Method of Measurement for Relative Whipping Capacity

The sample measurement made thermometer is heated until 20 ° C. Measure is of 100 ml and 75 ml. Kitchen Aid Professional sample is taken and transferred to the mixer. 6th cycle in the mixer for 1 minute, blended for 2 minutes at the 10th cycle. After the beating, the foam formed is transferred to measuring cup to 1000 ml. Leaves no residue in the mixer vessel is attempted whenever possible.

Foaming capacity relative reading of the following formula

$$\%RWC = V * 100 / 75$$

### 2.2.2 Analysis and calculate for whipping stability.

Foam do not fall, after measuring whipping capacity, and at the end of an hour amount of leakage weigh and calculated whipping stability by the formula

S: Whipping stability;

$$\%S = (1 - W / 77,25) * 100$$

### 2.2.3. Analysis method for brix and pH

pH measurements will be used in table-top type device. Device is calibrated by the buffer solutions for 4.01, 7.0 and 10.0. pH meter probe is pressed into the sample immersed in pH measurement button and wait 40 sec. After measuring the pH value is recorded as time runs out on the screen. Refractometer at 20 ° C the calibration is done with distilled water. The prepared egg white samples were incubated in a warm water bath until 20°C. Heated read the refractometer taken with a little spatula to 50 ml sample. Reading sample is brix%.

### 2.2.4. Meringue dough performance

200 ml egg white's samples is heated at 20 ° C . 200 g is provided to dissolve by the addition of sugar. Taken mixer. Blending sugar and egg white mix to 4th cycle for 1 min and 10th cycle for 4 minute . After blending , caliper measurement is taken from the high portion of non-container mixer. So, meringue dough performance measured .

## 3. Results and discussion

0.1%, the lowest rate used for NaOH, led to an increase of 1 unit at pH and, as the quantity used increases, it was seen that the change in pH increased in the same rate (Table 1). The highest rate, used in the following table, became 0.3% and, in the uses over this, it was seen that egg white improved irrevocably. In view of this, it was not gone up the rate of 0.3%.

Table 1. Effect of NaOH adding on chemical properties of performance of white egg

Samples	pH	Brix	Foam Capacity	Foam stability	Meringue crema height
Control 1	8,5	14,2	440	57,2	Non formed crema
0,1% NaOH	9,3	14	640	62,4	6,0
0,2 %NaOH	10,1	14	750	65,7	7,1
0,3 Na%OH	11,0	14	853	72,8	8,6
Control 2	8,8	14	553	60,2	Non formed crema
0,1% NaOH	9,5	14	720	65,3	6,0
0,2% NaOH	10,4	14	890	75,4	7,2
0,3% NaOH	11,5	14	950	80,9	8,4

The positive effect of using 0.1 N NaOH in low quantities was observed. It is possible to mention about small foam bubbles, stability that increases, and NaOH use with H<sub>2</sub>SO<sub>4</sub> for natural pH [8]. In our study, a result supporting literature was observed. In the study specified above, the stability and foam capacity was mentioned about. Also in our study, it was seen that even in egg whites having high concentration, the desired improvement was provided.

If the negative variation in pH is ignored, it was seen that there were positive effects on the performance of white egg. In the other additives used, while improvements in control group shows a variability compared to the beginning concentration and the amount of egg yolk contamination, in NaOH, these variabilities were not seen in the considerable rates, as the quantity increases, improvement actualized significantly. In Brix, an important variation was not seen and it was considered that the decrease of 0.2 units in the first control group may be related to the precision of instrument.

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**Compliance with Ethics Requirements.** Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

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