

возврата крови к сердцу при изменении позиции тела в большой мере зависит от тонуса крупных вен.

Для повышения ортостатической стойкости, а следовательно, и физической работоспособности, нами предложено включать ежедневно в рацион питания студентов соки-пюре из облепихи, черноплодной рябины, калины как продукты, содержащие достаточно высокую концентрацию фенольных веществ-биофлавоноидов. Для проведения эксперимента была отобрана группа девушек, которая состояла из десяти студенток. Для всех участниц эксперимента было проведено контрольное обследование на ортостатическую стойкость – установлено учащение пульса в ортостатической позиции. Далее каждый день в обеденный рацион девушек включали соки-пюре из перечисленных ягод. Наблюдения продолжались в течение месяца: два раза в неделю во время факультативов по физкультуре для каждой студентки проводили ортостатическую пробу и устанавливали учащение пульса.

В результате такого эксперимента было установлено, что поступление в организм биофлавоноидов постепенно способствует росту тонуса кровеносных сосудов, в том числе и венозного. Таким образом, при длительном употреблении рационов питания, содержащих биофлавоноиды, можно значительно улучшить ортостатическую стойкость спортсменов, их физическую работоспособность и, как следствие, способность противостоять экстремальным физическим нагрузкам.

## **THE EFFECT OF MILK WHEY ON THE ELASTICITY OF THE STUFFED DOUGH**

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Traditionally, the most popular confectionery among Ukrainians is products made of unfermented flaky dough. Products made of flaky dough are characterised by high fats content necessary for their flaky structure and tenderness, which are the results of numerous puffs of the dough. But the products of this group are also characterised by low level of proteins which negatively influences their nutrition value. One of the most perspective ways of creating a great variety of products and making the nutrition value

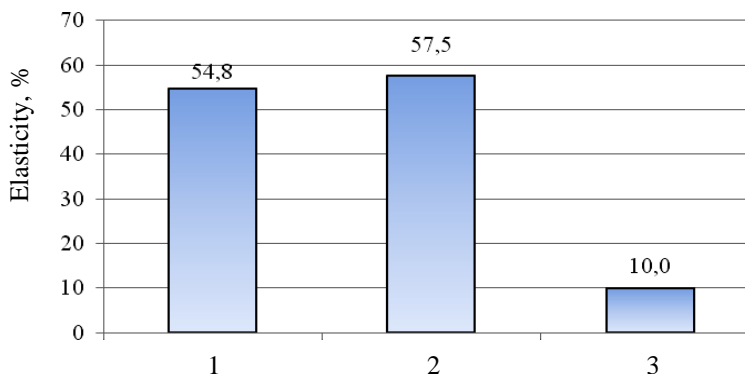
higher of the flour-based confectionery is design of new production technologies with use of secondary dairy raw material which is a source of proteins. The most attractive product among secondary protein-carbohydrate dairy raw material (these materials are obtained after production of cheese, acid curd cheese, and casein) is milk whey. Biological value of milk whey is determined by proteic nitrogenous compounds (e.g. essential aminoacids), carbohydrates, lipids, mineral salts, vitamins, organic (carboxylic) acids, etc.

Standard technology prescribes using of citric or tartaric acids as improving agent of gluten quality at dough kneading. It is well-known that protein viscosity gets higher in weak acid medium. As the result, dough becomes more elastic. Milk whey, containing organic (carboxylic) acids, may be used as a replacing agent.

The timeliness of this technology is in replacing water and citric acid in production of semi-finished unfermented flaky dough by milk whey. Milk whey is a valuable source of essential aminoacids. In addition, milk whey is characterized by a low-level of industrial processing.

We carried out the impact of whey on the qualitative characteristics of semi-finished flaky dough and products made of it. As a studied sample, we cooked dough where citric acid and water were replaced by whey. The reference samples were represented by flaky dough cooked under standard technology and unfermented dough without content of gluten quality improving agent – organic (carboxylic) acids. The quantity of whey was calculated basing on the moisture content of dough (40%), and taking into account moisture of original raw material.

To define the type of whey impact on the qualitative characteristics of gluten, we proposed a method of determining elasticity and resilience of dough. For this method, it is necessary to have a dough sample batch weight of 5 g. Then, it should be put on a sheet glass oiled by a seed-oil and located on a millimetre squared paper. It is required to record the size of the dough sample. The sample should be covered by the same sheet glass as the one it is placed on. Then, a 1 kg weight should be put on it for ten minutes. After this, take 1 kg weight and cover glass sheet off the lower glass sheet with batch weight. Then, diameter of the dough sample should be marked on the millimetre squared paper in several dimensions. Elasticity unit is change of sample area after applying the weight. It is denoted in %. The results of the research are presented at the Figures 1.



**Fig. 1. The results of the research of dough elasticity:**  
**1 – Studied sample; 2 – Reference sample cooked with citric acids;**  
**3 – Reference sample cooked without citric acids**

According to expectations, the reference sample without acids is characterised by low elasticity. Its area enlarged by 10,0% after taking the weight off, which is 5,8 times lower than has the sample cooked with citric acid. As we can see from the figures, elasticity of dough with whey is only 4,8% lower than elasticity of the reference sample cooked with citric acid. It constituted 54,8% which is in the range of experimental uncertainty.

So, elasticity equal to semi-finished dough made under standard technology, and product yield and moisture content of the goods made using such dough, are preserved. Thus, making out a conclusion of the study, it is possible to say that the positive impact of replacing water and citric acid by milk whey in production technology of semi-finished unfermented flaky dough is proved.

### **STUDY OF THE INFLUENCE OF HIGH PRESSURE AND THE INTRODUCTION OF SOY PROTEIN ISOLATE ON SOME PROPERTIES OF PORK MEAT BATTERS**

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High pressure treatments of sausage batters were carried out in a 0.3 L capacity high pressure vessel (S-FL-850-9-W/FPG5620YHL, Stansted