

# Sushka – a Russian specialty

ABOUT 30 EASTERN-EUROPEAN PRODUCERS OF BAKED GOODS MET IN WROCLAW, POLAND, TO PARTICIPATE IN A SUSHKA AND PRETZEL SEMINAR



**++ figure 1**  
Ken Zvoncheck,  
Director Technical Services at  
Reading Bakery System

**++ figure 2**  
Packed Sushkas – popular  
product all over Eastern Europe

**++ figure 3**  
Cutting Sushka on die face

**++ figure 4**  
Extruded Sushka

**+** Sushkas are a type of national dry baked good for Russians and other Eastern Europeans. The round snacks resemble small bagels. Sushkas come in different shapes, ranging from oval to round, in different sizes and with different toppings such as poppy seeds or sesame seeds. The baked goods are often eaten “on the go” or they are dipped into tea. Even the Russian Army is said to have distributed these baked goods which have a shelf life of 12 months to their soldiers as snacks as a last resort. Large Sushka producers in Russia are for example Nevskaya Sushka in St. Petersburg and Vladimirskij Hlebokombinat in Vladimir. Both producers designed and built the equipment for their production units themselves. According to Vladimir Ponomarev, General Director, Nevskaya Sushka, the company has a monthly output of 400 tons of Sushka for the markets in St. Petersburg, Moscow, and the North-West of Russia. It is mainly supermarkets on the list of customers.

Ponomarev attended the Sushka and Pretzel seminar, organized by Reading Bakery Systems, Robeson, Pennsylvania, USA, to learn something new about the Sushka production. Ken Zvoncheck, Director Technical Services at Reading Bakery System admitted at the beginning of the seminar that he had very little experience on the production of Sushka and that he had to familiarize himself thoroughly with this topic before attending this event.

The American company is more recognizable for its equipment and machines for the production of salt sticks, biscuits and extruded bread. However, research by Reading, revealed that the Sushka plants in Eastern Europe are almost obsolete. Some of the machines have been in operation for more than 70 years. The potential for new machines seems to be correspondingly high.

## Sushka production

The list of ingredients needed for Sushka is short: flour, sponge dough, shortening, sugar, salt, yeast, and water. Ken Zvoncheck gave his opinion on which quality the individual ingredients should have. The protein level (flour strength) of the wheat flour should be 8.5 – 9.0%. The moisture content should be below 14% and the ash content not exceed 5%. Fats and oils provide aroma. Liquid fats yield a tenderer product. As a sweetener, Ken Zvoncheck recommends either malt syrup or crystalline sugar. However, too much sugar yields a harder texture.

There are three type of leavening in Sushka production: mechanical, biological, and chemical. The mixing and kneading of the ingredients creates air pockets in the dough. It is also possible to laminate the dough. Yeast and water that are converted into steam during baking take over the biological leavening. Furthermore, a chemical leavening agent can be added.



++ figure 1

**Simple Sushka recipe**

- + 100 g wheat flour
- + 35 g water
- + 26.5 g sponge dough (100 kg flour, 6.6 kg sugar, 1.7 kg yeast, 46.2 kg water, 30 minutes dough rest)
- + 10 g oil
- + 4.75 kg sugar
- + 2.5 kg salt
- + 0.625 kg dried yeast
- + No dough rest

**Dough preparation**

Depending on the type of mixer, the mixing time should be between 4 and 8 minutes. Ken Zvoncheck recommended a dough temperature of 32 °C. The dough is immediately processed after mixing. In Reading’s equipment, a twin screw extruder operating with a pressure of up to 6.8 bar (low pressure extrusion) presses the dough through a die. It is possible to use different dies in the extruder for the production of different shapes and sizes. “Low pressure extrusion has the advantage of lower process costs compared to other methods such as high pressure extrusion. The dough is treated much more gently. Added to that, a product change-over only takes 30 minutes, and the low pressure extrusion is a continuous process.” explains Zvoncheck.

After the dough has been pressed through the stainless steel die, it is cut off. The dough pieces drop down onto the proofing belt. The pressure applied during extrusion presses too much air out of the dough, so the proofing step becomes an important part of the Sushka production. Temperature, time



++ figure 2

and humidity have a direct effect on the texture. Furthermore, skinning over of the dough pieces is also able to take place.

After this, there is one of the most important steps, namely the cooking process and with that the change of pH. The cooker controls the shine, influences the texture and the taste as well as the color of the baked item. The higher the pH; the darker and tastier the products. Depending on the product and taste, the pH of American soft pretzels varies between 6.0 and 9.5.

**Baking process**

Reading Bakery Systems distinguishes three steps in the baking process of Sushka and soft pretzels. The first step in the oven, is important for the development of the product and is therefore called the “development section”. Biochemical and physical reactions promote the flavor development. The core temperature in Sushka rises within 60 seconds to 90 °C, depending on the type of oven and the weight of the dough piece. After about 2 minutes, the “setting section” is reached. Convection is used to remove the moisture from the dough. Here, the final product shape is reached and the activity of amylase is stopped by the increasing core temperature. Two minutes later is the “coloring section”. Here, the products will obtain their final color.

According to Ken Zvoncheck, a Sushka and Pretzel production line, with a processing capacity of 500 kg dough per hour (width 1,200 mm, length 30 m) will cost about 995,000 Euros. The American company has just installed such a plant in Poland. +++



++ figure 3



++ figure 4