THE SPEED OF COOLING SWEET PEPPER FRUIT
OF TECHNICAL STAGES OF MATURITY

V. Koltunov, K. Kalaida

The pepper fruits are different in size, weight, diameter, length, wall thickness, and also have a different chemical composition, energy value, which widely varies: technically ripe fruits contain the dry matter in the range of 8.1–15.1%, the amount of sugar is 1.7–6.9%, and the biological ripe fruit, respectively, of 8.9–15.0% and 2.5–7.3%.

Quality control of fruits is carried out according to DSTU 2659-94, in the EU countries using the UNECE standard FFV-28, in Ukraine there is an analogue of DSTU UNECE FFV-28:2007. All standards define the quality of the fruit, which are typical of this cultivar, but does not define the requirements for the chemical composition of fruits, their thermal and physical characteristics, which have a crucial role not only for food, but also as storage object.

The research objective is to define the speed of cooling of pepper fruits different in size and weight, and therefore their thermal capacity.

The thermal capacity of fruit depends of dry matter content. If the dry matter content is 8.1%, follow the formula V.Z. Zhadan thermal capacity of pepper fruit gonna be 3.96 kJ/kg·K, and if the content of 15.1% of dry matter – 3.77 kJ/kg·K, at temperature +25°C the pepper fruit will contain a 99.0 kJ/kg of heat, in the second pattern – 94.25 kJ/kg. In the first pattern, 1 t of pepper fruit will contain 99000 kJ of heat, in the second – 94250 kJ, or on 4750 kJ less, so their cooling in the fridge require less energy.

Heavy and large in diameter fruits (200 g, 75 mm) reduce temperature to 0°C within 130 min. Difference in weight by 28 g between the first and second fruit, the first and third fruit – 106 g, respectively, the duration of cooling was on 10 min longer.

Warming-up of fruit became faster. For warming 1 and 2 fruits need 120 min, 3 fruit – 60 min, so, warming-up of small sweet pepper fruits pass twice as fast, just as was observed sweating fruit, with intense formation on the surface “infectious droplets”.

Keywords: sweet pepper, speed of cooling, warming-up, thermal and physical characteristics of sweet pepper fruit, storageability, temperature, thermal capacity.