TECHNOLOGICAL FEATURES OF IODIZED WATER PRODUCTION

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Keywords: *iodized water, production technology.*

Introduction. The drinking water and mineral water market shows that the consumer is often interested in the use of waters for prophylactic purposes, fortified with microelements, vitamins, etc. Over the years of experience, the population has been interested in iodized water.

Material and methods. In collaboration with the National Center for Public Health, a study was achieved about iodine deficiency in a group of children and its reduction due to the consumption of iodized fortified water. The water production technology fortified with this microelement was developed and implemented.

Results. The following technological process is used to produce iodized fortified water. The water extracted from the artesian well is divided into two streams: (1) the first stream is filtered at 20 µm, softened by the ion exchange plant or dosed antiscalant in the stream, filtered at 5 µm, demineralized by the reverse osmosis plant and collected in tanks E3, E4 and E5 with total volume V150m3; (2) the second stream is filtered at 20 µm, passed through the zeolite filter, filtered at 5 µm, then mixed with the first stream in the collection tanks E3, E4 and E5. The ratio of water flows is established in such a way that the mineralization of the obtained water is equal to 0.45-0.65 g/L, in a ratio of approximately 60/40%. In sections, the water undergoes final filtration through a 1-µm filter, then disinfected by bactericidal plant and sent to the bottling lines. The iodine concentrate is dosed with the dosing pump into the water stream immediately before bottling. The production capacity of the dosing pumps is calculated based on the amount of water in the flow, which drains in a unit of time and the concentration of iodine. The iodine concentrate is calculated using the following formula:

$$A = (Q \cdot K2)/K1 \quad (1),$$ whereas:

A - the amount of iodine concentrate, dm^3;
Q - the amount of water in flow, dm^3/h;
K2 - iodine concentration in the finished product, $\mu g/dm^3$;
K1 - iodine concentration in iodine concentrate, $\mu g/dm^3$.

The production capacity of the dosing pumps is calculated by the formula:

$$D = 100 \times A/Qm, \quad (2),$$ in which:

D - production capacity of the dosing pump, %;
A - the required amount of iodine concentrate (from formula 1), dm^3;
Qm - maximum production capacity of the dosing pump, dm^3/h.

From the collection tanks the water is transmitted to the bottling department. Prior to bottling, the organoleptic characteristics (clarity, color, taste, odor, presence of foreign inclusions) of the water are determined, as well as the iodine content, which must be within the range of 80-125 $\mu g/dm^3$. If the water meets both the requirements of SF 06817943-002 and the recipes, it is sent to bottling and in the sales packaging. In case of deviations from the iodine content, the production capacity of the dosing pump is corrected.

Conclusions. The implemented technology allows the production of iodized water, which is beneficial for the prophylaxis of goiter edema in the population.