

PHYSICO-CHEMICAL QUALITY WATER USED IN A MEAT PROCESSING FACTORY FROM TIMIȘOARA

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Abstract

During food processing, water is coming in contact with raw materials, or represent itself a basic raw material. This impose the necessity that water used in food industry to correspond to quality standard 458/2002. The goal of the study was to establish the most important physico-chemical parameters level of tape water used in meat processing and if these parameters are between legal admitted limits. Excepting total hardness, which is double than admitted level, the other quality parameters were between admitted levels.

Keywords: *water, physico-chemical quality.*

Introduction

Water is a one of major environment component which influences the biosphere and social-economic life of planets. It also represents the major life matter where took place the essential metabolic reactions; it determines the weather forecast and contribute to the matter circuit in nature. Water is one of the most important component in food technology (Drugă, 2002).

During food processing, water is coming into contact with raw materials or represent itself a raw material. This impose the necessity that water used in food industry to corespond to quality standard of potable water according to 458 / July 2002, Law.

The goal of the study was to establish the most important physico-chemical parameters level of tape water used in meat processing and if these indicators are between legal admitted levels.

Experimental

To evaluate the physico-chemical water quality from a meat processing factory we sampled water 5 times, each at ten days. To determine aluminium, the samples were taken both in summer and winter.

Samples prelevation, conservation, identification, transportation and preservation were made according STAS 2852/93.

For each sample were determined the next physico-chemical indicators:

- total residual chlorine by STAS 6364/78 method;
- pH by ST ISO 10523/97 method;
- turbidity by ST ISO 6323/88;
- oxidability by ST ISO 6060/96 method;
- manganese by ST ISO 6333/96 method;
- total hardness by STAS 3326/76 method;
- aluminium by STAS 6326/90 method;
- iron by ST ISO 6332/96;
- nitrites by ST ISO 6777/96;
- ammonium by STAS 6328/85.

The obtained data were statistically processed by ANOVA method.

Results and Discussions

Mean values of physico-chemical quality parameters used in a meat processing factory from Timișoara are summarized in table 1.

Residual chlorine is represented by the exceeding chlorine remained in the disinfected water, after 30 minutes of chlorine and water contact. The presence of chlorine in the disinfected water has a great sanitary importance because this is the prove that it was enough chlorine and the distribution water network is safe. In this case, residual chlorine had 0.300 ± 0.002 mg/l mean value. This indicate that water prelevation was made at the middle of the water network.

pH mean value was 7.358 ± 0.028 pH units, value that range among the admitted limits.

Table 1. Mean values of physico-chemical water parameters quality used in meat processing

Specification	$\bar{x} \pm S_x$	DS	Min.	Max.	Confident level (95%)	Admitted limits*	
Residual chlorine (mg/l)	0.300±0.002	0.05	0.25	0.35	0.062	entrance 0.50 exit 0.25	
pH (pH units)	7.358±0.028	0.063	7.28	7.44	0.078	6.5-9.5	
Turbidity (UNT)	0.906±0.380	0.851	0.15	2.28	1.057	≤5	
Oxidability (mgO ₂ /l)	0.92±0.08	0.185	0.7	1.2	0.230	5.0	
Mn (mg/l)	0.022±0.001	0.003	0.018	0.028	0.004	0.05	
Total hardness (Germans degree)	10.24±0.40	0.884	9	11.2	1.09	5.0	
Al (mg/l)	Summer	0.048±0.016	0.029	0.035	0.065	0.02	0.2
	Winter	0.181±0.018	0.041	0.13	0.225	0.052	
Fe (mg/l)	0.116±0.010	0.023	0.081	0.142	0.028	0.2	
Nitrites (NO ₂ ⁻)(mg/l)	0.020±0.004	0.010	0.005	0.030	0.012	0.50	
Ammonium(NH ₄ ⁺)(mg/l)	0.034±0.005	0.012	0.02	0.052	0.015	0.50	

* Based on 458/2002 Legal Act

Turbidity mean value was 0.906 ± 0.380 UNT, value that also range among the admitted limits.

Oxidability and manganesse mean values were 0.92 ± 0.08 mg O₂/l, respectively 0.022 ± 0.001 mg/l, both under the admitted limits (5.0 mg O₂/l., respectively 0.05 mg/l).

Total hardness, expressed in german degrees had a 10.24 ± 0.40 mean value, which is more than double admitted limit stipulated in 458/2002 Law. Water hardness is given by magnesium and calcium salts. Higher calcium and magnesium salts in water forms depositions and rise the temperature during food processing (Tofan, 2001). Also, higher calcium salts can forms a hard crust on the food surfaces.

Aluminium mean value in summer was 0.048 ± 0.016 mg/l, and in winter was 0.181 ± 0.018 mg/l, both among the admitted level, but, during winter, in two samples were registrated values as 0.22 mg/l, respectively 0.225 mg /l, which are over the admitted levels, even if was used the same coagulant quantities [Al₂(SO₄)₃]. This happens, usualy, when days temperature registered lower values and doesn't

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from Timișoara*

statione enough in decantors, which determined $[Al(SO_4)_3]$ flocculence in water network.

Iron and nitrites mean values were 0.116 ± 0.010 mg/l, respectively 0.020 ± 0.004 mg/l, both under the admitted level, 0.2 mg/l. respectively 0.5 mg/l.

Same situation was registrated in ammonium case to, which had a 0.034 ± 0.005 mg/l, mean value, under the admitted level 0.05 mg/l.

Conclusions

Excepting total hardenss, which is double than admitted limits, mean values of physico-chemical quality parameters of water used in meat processing factory from Timișoara were between admitted levels.

References

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*** Law 458/July 2002 regarding the quality of potable water.

*** Romania Standards collections regarding physico-chemical analysis of potable water.