EPRA International Journal of Agriculture and Rural Economic Research (ARER)- Peer-Reviewed Journal
Volume: 8 | Issue: 3| September 2020| Journal DOI: 10.36713/epra0813|Impact Factor (SJIF): 7.367| ISSN: 2321 - 7847

INVESTIGATION OF THE OXIDATION OF HYDROGENATED FATS

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ANNOTATION

The process of oxidation of salomas in the presence of catalytic metals on a nickel-copper base is established. It is shown that the temperature of the process has a significant effect on the oxidation processes, demethylization of salomas, reduces their oxidation processes.

KEY WORDS: ***Hydrogenated fats, fatty acids, catalytic systems, oxidation processes, hydrogenation products.***

INTRODUCTION

In recent years, the requirements for the quality of modified fats have increased significantly. The correct conditions for their storage and transportation are becoming increasingly important, since as a result of unsatisfactory storage conditions of fats, their quality and biological value are reduced, and organoleptic characteristics deteriorate. In some cases, due to the ongoing oxidative, hydrolytic and other processes, it becomes impossible to use such fats for food purposes. This causes unjustified losses, especially in fat processing plants, where fats are stored for further processing.

Prevention or slowing down of oxidative processes in fats is one of the most important tasks in their production, transportation, storage, processing. In order to preserve the nutritional properties of oil and fat, we must not only raise the technical level of warehouses of fat and oil enterprises and improve storage technology, but also, if possible, exclude the possibility of oxidative processes at the stage of fat modification.

Results for their discussion 1 shows the relative rate of oxidation of some individual fatty acids (the rate of oxidation of steraric acid is taken as 1).

Relative rate of fatty acid oxidation Table 1.

Fatty acids	The relative oxidation rate
Stearic	1
Resinova	10
Linoleic	100
Linolenic	150
a-Eleostearic(9-CIS, 11-TRANS, 13-Trais)	800

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The dynamics of oxidation of salomas obtained in the laboratory were studied. The study was conducted on model samples of salomas.

Hydrogenated raw materials refined, deodorized cotton oil with the following indicators:
acid number - O,1 mgcon/g
peroxide number -,5mol½o/kg;
anisidine number - 1.5;
phosphorus-containing substances do not exist;
mass fraction of moisture -0.05%;
soap (high - quality sample) - none;
fatty acid composition, %:
C16:0-6,0; C18:0-3,9; C18:1-25,3;
C18::2-64,O; C22:0-0,8
The conditions of hydrogenation:
flow reactor with a capacity of 1 l with agitator;
mixing speed - 250ob/min;
hydrogenation temperature-180C for Nickel-copper catalyst
2000sdlya Nickel-coppercatalyzernm-4;
hydrogen feed rate - 3.0 l/min;
duration of hydrogenation-1H.
Characteristics of the physical and chemical parameters of the obtained salomas are presented in table 2. their fatty acid composition is shown in table.3
Model samples of salomas were stored at two temperatures:
room temperature (20-25 °C), solid;
50 0C, in a biological thermostat, n molten state.
The results obtained in the evaluation of oxidative processes occurring during storage are shown in Fig.1 and 2

Fatty acid composition of the studied salomas table 3.

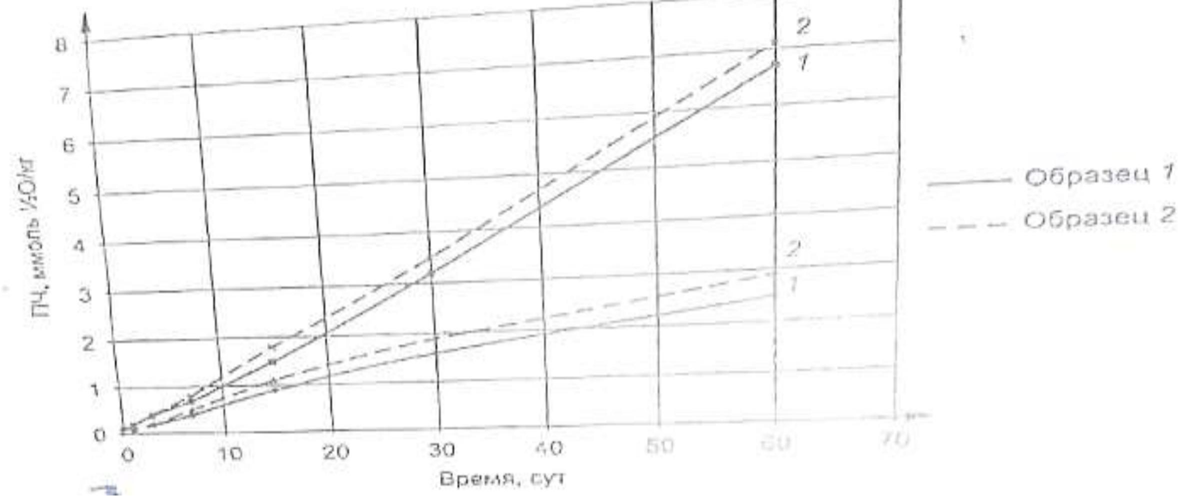

Fig.1 change in the content of Salome peroxide (If) when stored at room temperature (1)and at 50C (2)

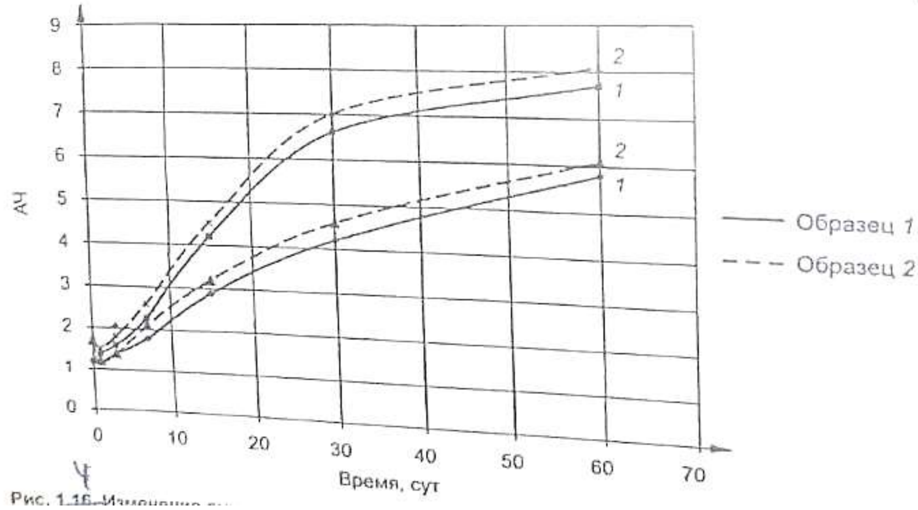

Fig.2 changes in the anisidine number (AH) of salomas during storage at room temperature (1)and at 50C (2)

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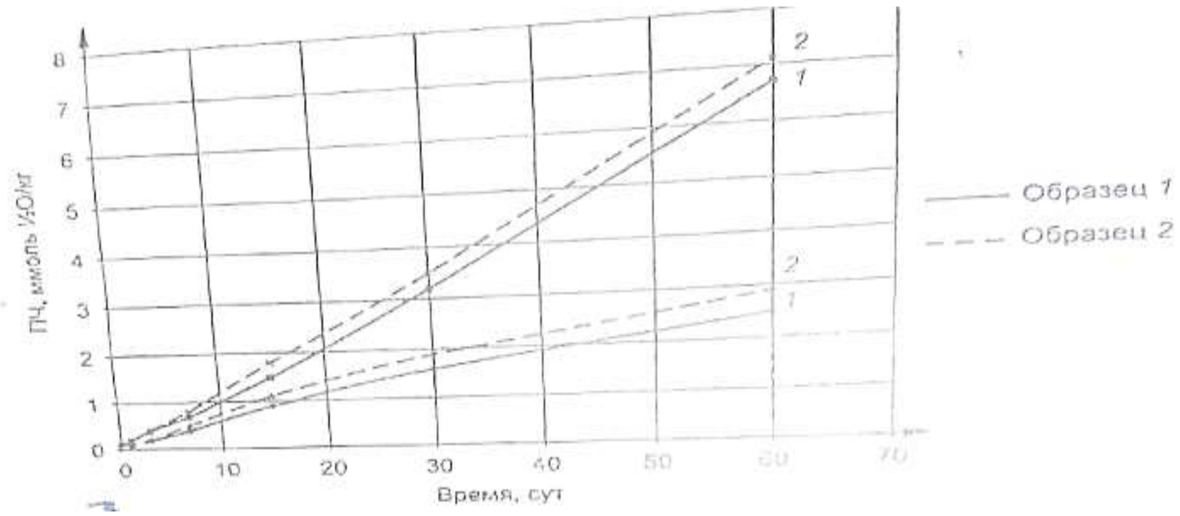

Fig.3 change in the peroxide number (if) of demetallized salomas during storage at room temperature. (1)and at 50C (2)

Model samples of demetallized salomas were stored at two temperatures, similar to the original sample:
• Room temperature (20-25C), solid;
• 50C, in the biological thermostat,in the molten state.

When evaluating the oxidative processes occurring during storage, the results shown in Fig.3 and 4 were obtained

Fig.3 change in the peroxide number (if) of demetallized salomas during storage at room temperature. (1)and at 50C (2)

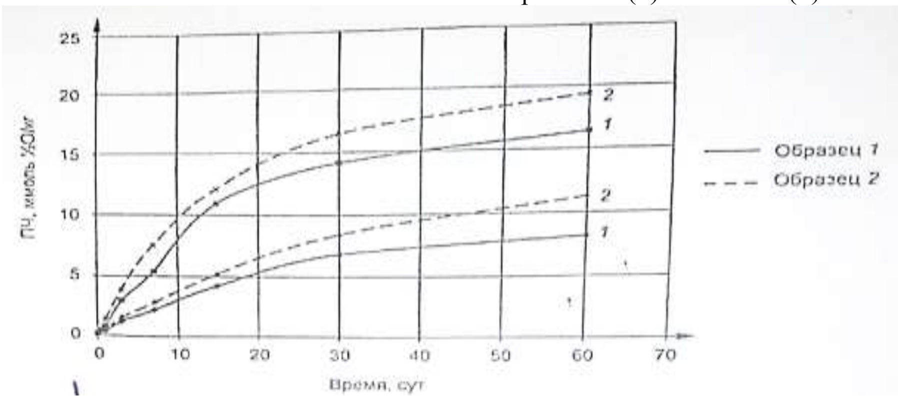

Fig.4 change in the anisidine number (AH) of demetalized salomas during storage at room temperature (1)and at 500C (2)

The graphs show that the rate of oxidation of the initial model samples of salomas is significantly higher than that of those subjected to demetalization using citric acid and activated adsorbent. Almost the same amount of primary and secondary oxidation products formed during storage of demetallisiropane salomas is characteristic, despite a significant difference in the degree of unsaturation between the samples. Thus, it was found that the content of a Pro-oxidant metal in salomas affects the dynamics of oxidation significantly more than the degree of unsaturation of triglycerides (with a low degree of unsaturation).

CONCLUSION

To reduce the impact of oxidative processes on the quality of salomas, it is necessary to demetalize it immediately after production, and it is desirable to include this operation in a single technological cycle.

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