



Application Note AN-R-031

PEG对香肠氧化稳定性的影响

Reliable and accurate determination of the oxidation stability of sausages with the polyethylene glycol method

The antioxidant content in foods is of great interest, especially for meat products such as sausages. In addition to fat, sausages also contain a lot of water. They have a complex matrix including salts and various natural or added antioxidants and stabilizers.

The Metrohm Rancimat method answers the question of how to measure antioxidants in sausages. Using this method with polyethylene glycol (PEG) as carrier material, the antioxidant measurement in sausages can be determined

quickly and reliably. The sample is analyzed without any preparation needed. The induction time can be related directly to the antioxidant capacity—and therefore to the possible shelf life of the sample.

This Application Note describes the determination of the oxidation stability of different sausages with the recommended method from Metrohm using an 892 Professional Rancimat.

SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on cervelat and bratwurst sausages.

The sausage samples are measured directly with

the Rancimat.

No sample preparation is required.

EXPERIMENTAL

First, an appropriate amount of chopped sausage and PEG are weighed into the reaction vessel, and then the analysis is started.

With the Rancimat method, the sample is exposed to an airflow at a constant temperature

of 100–180 ° C (**Figure 1**). Highly volatile secondary oxidation products are transferred into the measuring vessel along with the airflow where they are absorbed in the measuring solution.

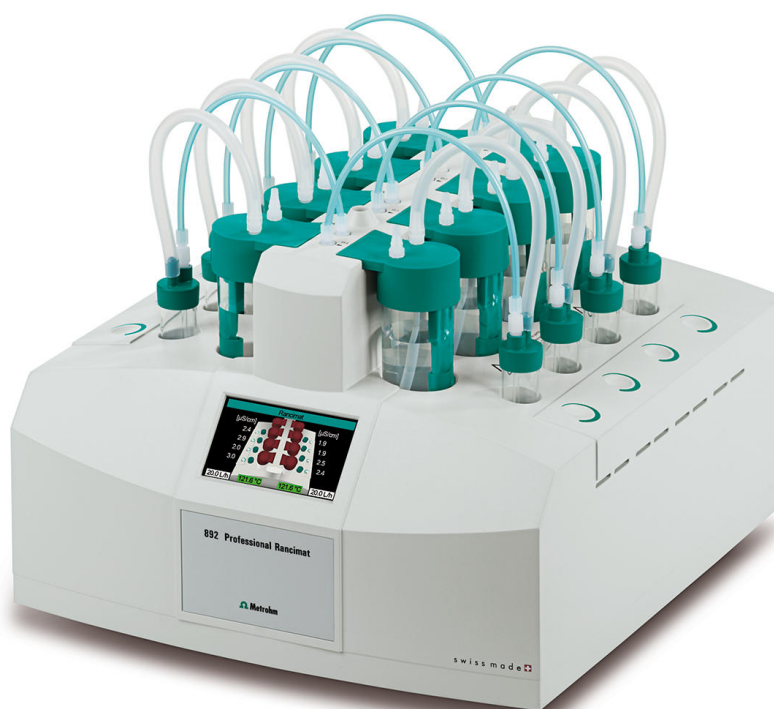


Figure 1. 892 Professional Rancimat equipped with measuring and reaction vessels for the determination of oxidation stability.

The conductivity of the measuring solution is continuously registered. The formation of secondary oxidation products leads to an increase in the conductivity. The time until

occurrence of this marked conductivity increase is referred to as the «induction time», which is a good indicator for the oxidation stability (**Figure 2**).

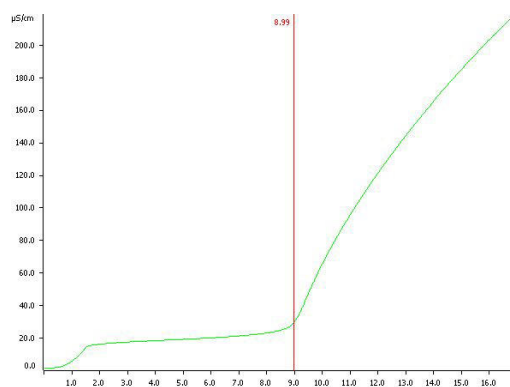


Figure 2. Determination of the oxidation stability of a cervelat sausage. Induction time is determined at 8.99 h.

Table 1. Results of the oxidation stability of sausages with the 892 Professional Rancimat at 100 ° C.

Sample (n=4)	Mean value (h)	SD(abs) in h	SD(rel) in %
Cervelat	8.75	0.75	8.6
Bratwurst	2.29	0.17	7.3

Table 2. Results of the oxidation stability of sausages with the 892 Professional Rancimat at 120 ° C.

Sample (n=4)	Mean value (h)	SD(abs) in h	SD(rel) in %
Cervelat	1.44	0.06	3.8
Bratwurst	1.99	0.16	8.0

CONCLUSION

Most sausages can be measured directly with the Rancimat for their oxidation stability. This determination helps to guarantee a consistent high quality of the finished product.

Thanks to the PEG method, conclusions can be drawn about both the antioxidants and the stabilizers in the processed end product. Since

there is no sample preparation, the direct influence of the entire matrix of the sample is seen, and not just individual components.

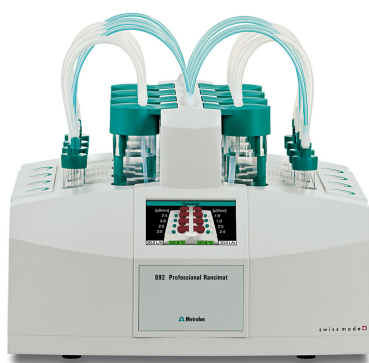
With the Rancimat, this quality parameter can easily and simultaneously be determined for eight different samples at a time, increasing quality control laboratory throughput.

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CONFIGURATION



892 Professional Rancimat

892 Professional Rancimat 是用于通过已使用多年的 Rancimat 方法来测定天然油脂的氧化稳定性的分析系统,即简便又安全。2 个加热块中共有 8 个测量位置。内置显示屏可显示设备状态和每个测量位置。每个测量位置都有启动按钮,可在仪器上启动测量。采用实用的一次性反应管和可使用洗碗机清洗的附件可将清洗工作降至低。这即可节省时间和费用,并且也可显著提高。

执行测定所需的所有附件均已包括在标准配置内。需要使用 StabNet 软件来进行仪器控制、数据记录 and 评估以及数据保存。