



Application Note AN-R-031

# Oxidation stability of sausages with PEG

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.

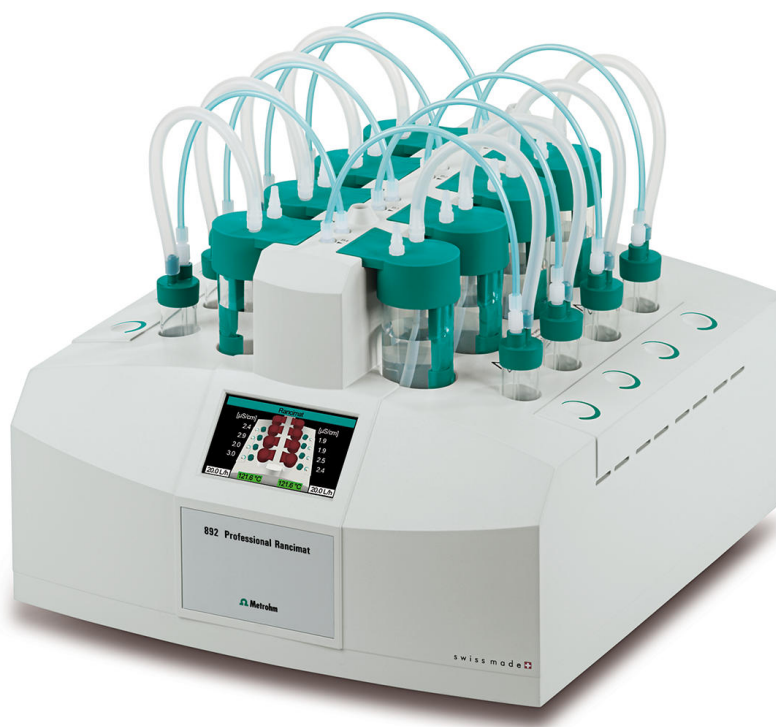
No sample preparation is required.

## 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

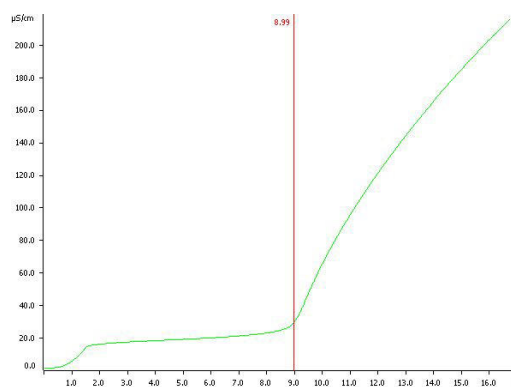
(Figure 1). Highly volatile secondary oxidation products are transferred into the measuring vessel along with the airflow where they are absorbed in the measuring solution.



**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.

## CONTACT

Metrohm France  
13, avenue du Québec - CS  
90038  
91978 VILLEBON  
COURTABOEUF CEDEX

info@metrohm.fr

## CONFIGURATION



### 892 Professional Rancimat

Le 892 Professional Rancimat est un système d'analyse moderne permettant une détermination simple et fiable de la stabilité à l'oxydation des graisses et huiles naturelles par application de la méthode Rancimat, bien établie depuis de nombreuses années. Doté de 8 positions de mesure réparties dans 2 blocs de chauffage. L'afficheur intégré indique l'état de l'appareil et de chacune des positions de mesure. Les touches de démarrage pour chaque position de mesure permettent le démarrage de la mesure sur l'appareil. Des récipients à réaction à usage unique et des accessoires lavables en machine réduisent les coûts et le travail de nettoyage à un minimum. Ceci fait économiser du temps et de l'argent tout en améliorant l'exactitude et la reproductibilité de manière considérable.

Tous les accessoires nécessaires aux déterminations sont fournis. Le logiciel StabNet est requis pour le contrôle de l'appareil, l'enregistrement des données et leur évaluation, ainsi que pour leur sauvegarde.