

## SAUSAGES IN THE SMOKING STAGE

Anghelescu Constantina , Tănăsescu Gheorghe

Constantinescu Carmen , Zafiu Constanța

The smoking process has two aims, namely: to obtain a longer storage period and to enhance the tastiness of the product owing to the components of the smoke accumulated and diffused during the process.

The part played by the smoke as a preservative and aromatizer results from its antiseptic , antioxidant and aromatizing action. Tilgner (3) Kurko (1), Dolezal , Crilova (2) , Petrousek , Ziemba are assigning this action to the phenols , aldehydes , ketones and acids from the smoke. It specially results that the main role of the smoke's components is assigned to the phenols.

Some remarks

One concern in our research work arising interest , was the study of the penetration of the phenols from the smoke into the paste of the raw sausage.

Research work was based on the principle of an appropriate accumulation of phenols, the basic components of the smoking agent - the smoke - depending on the different types of installations. By appropriate accumulation, we mean a quantitative presence in the product of the phenols who are leading, along a traditional application, to the formation and completion of the olfactory and sensorial qualities of the meat products.

## Materials and methods

Work was done on raw sausage filled in artificial casings (Cutizin) , 7,5 cm in diameter , on two types of installations:

A/ direct fire chamber (smoke obtained from wood + hardwood sawdust) ;

B/ tunnel - type experimental smoking installation with automatic control of the parameters (smoke obtained from hardwood sawdust in smoke generators).

For both installations smoking was realised in a continuous manner.

The phenol penetration in the product was followed by quantitative determination on layers and on average samples of the two layers:

a/ external layer 15 mm thick

b/ internal layer

The phenols dosing method is based on their distillation with steam and on colourimetric determination with paranitro - aniline (4).

The amount of phenols determined at the end of the smoking phase (average sample) for products obtained in A and B installations was 60 - 80 mg/kg dry matter.

The smoking period in installation A was 228 hours and in B 72 hours.

## Results and discussions

Data obtained by quantitative determination of the phe-

phenols on layers and average samples during smoking in both A and B installations are shown in table 1, and diagram 1-2.

In layer a the accumulated quantities are important enough and are different, depending on the installation.

In layer b the diffused phenol quantities are small.

Phenols accumulated in the first 36 hours are in greater quantity especially in the B installation.

The smoking phase was considered as finished in accordance with the current production.

The amount of phenols in average samples at the end of the phase was 60 - 80 mg/kg dry matter.

Weight losses respectively water losses in layer a were sensibly the same in both installations.

Data obtained with both installations show that phenol penetration is achieved in two stages. In the first one there is an intensive accumulation at the surface and just under the casing; in the second the diffusion takes place in the middle of the product.

The amount of phenols accumulated in layer a is 5 times bigger in installation B than in A, though in the average samples in both installations the values are sensibly near.

The evolution of phenol penetration in the phase subsequent to smoking showed on one hand a tendency to equalize the concentration of phenols in the two layers and on the other hand a more intensive loss of phenols in the layer a of the products smoked in installation B.

It is likely that part of the highly volatile substances from the product surface are lost shortly after the end of

of the smoking stage.

To draw a conclusion the smoking process can be hastened, as it has been proved by a quantitative phenol accumulation in a short time.

By reducing the accumulation time for an adequate quantity of phenols and by controlling all the technological parameters involved, conditions for a rational use of room and installations are obtained.

The amount of accumulated phenols represent the reserve of phenols necessary for the completion of the olfactory and sensorial qualities who become definitive within the ripening-drying process.



# LITERATURE CITED

1. V.I.Kurko - Fizico - himiceskie i himiceskie osno-  
vi kopcenia , Moskva, Piscepromizdat,  
1960 .
2. N.N. Crilova  
V.P.Volovinskaia - Roli letucih soedinenii v pridanii  
vcusa i aromata copcenia productam. The  
IX - th European meat Congress, Buda-  
pesta , 1963.
3. D.L.Tilgner e.a. - Cierna wytwornica dymu wcdzarniczego.  
Gospodarka Moesna nr. 6 /1963 p.4 - 6.
4. C.Anghelescu e. a. - Stabilirea parametrilor de afumare -  
fierbere la preparatele de carne in  
celula Atmos. Inst.de cercetări ali-  
mentare Bucuresti , 1965
5. D.C.Nenitescu - Tratat elementar de chimie organica.  
Ed.Tehnică, ed. IV , vol.I, 1956 ,  
p.406.
6. V.I.Kurko  
T.A.Schmidt - Interaction of carbonyl and reductone  
like components of smoke with amino-  
acids. The XV-th European Meeting of  
meat Research workers , Helsinki Fin-  
land 1969 , C 25.

Table 1

The Amount of Phenols - Referred to Dry Matter -  
During the Smoking Stage

| Nr. | Time of<br>sample<br>taking<br>after/h | Samples<br>A and B<br>install. | Phenols, mg/kg dry matter |                   |                   | %<br>humidity       |
|-----|--|--------------------------------|---------------------------|-------------------|-------------------|---------------------|
|     |  |                                | ext.layer<br>15 mm.       | internal<br>layer | average<br>sample | ext.layer<br>15 mm. |
| 1   | 36                                     | Install.<br><br>A              | 21-23,5                   | 1,2-1,4           | 16-19             | 54.5                |
| 2   | 84                                     |                                | 44-45                     | 1,8-2,2           | 25-39             | 52.0                |
| 3   | 132                                    |                                | 48-52                     | 2,4-2,6           | 45-46             | 50.8                |
| 4   | 180                                    |                                | 64-72                     | 2,4-2,7           | 52-54             | 49.0                |
| 5   | 228                                    |                                | 70-73                     | 3,1-4,3           | 60-64             | 48.6                |
| 6   | 24                                     | Install.<br><br>B              | 95-99                     | 1,8-2,0           | 61-63             | 51.5                |
| 7   | 48                                     |                                | 100-103                   | 2,4-3,5           | 64-67             | 49.2                |
| 8   | 72                                     |                                | 145-148                   | 3,5-4,1           | 73-83             | 47.6                |

Diagram 1

Phenol Penetration - Referred to Dry Matter -  
During the Smaking Stage  
Install. A

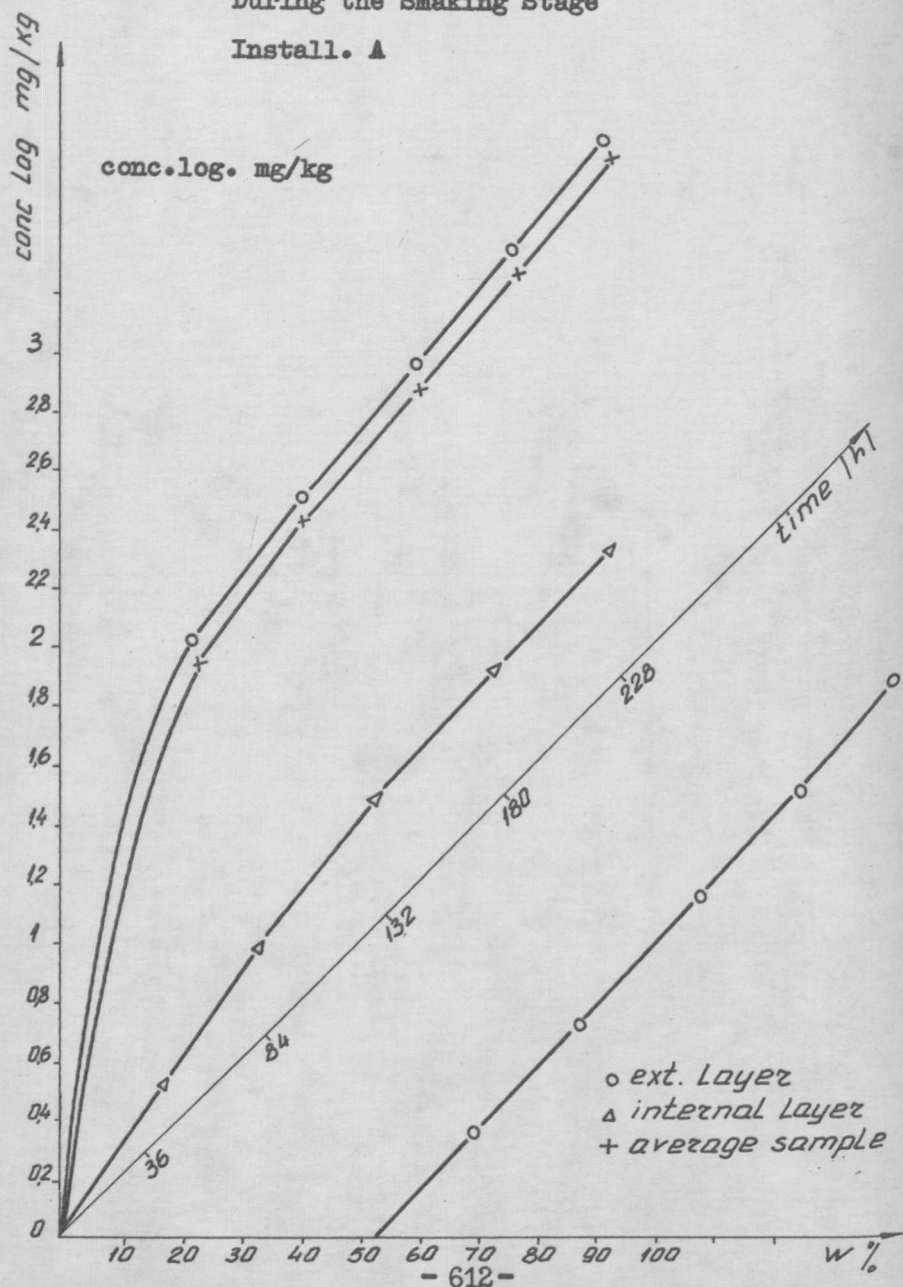


Diagram 2

Phenol Penetration - Referred to Dry Matter -  
During the Smoking Stage.  
Install. B

