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The Hygiene of the Smoke Process.

The smoke process is one of the oldest ways of conserving the foodstuffs. Therefore we still pay great attention to it in our research work. The technological character comes first and the last few decades serious hygienic questions arise.

The food hygienists were studying very thoroughly compound and changes of smoked meat products at first, and most analyses were similar to all other non - smoked foodstuffs.

Therefore they were first using organoleptical, physical, chemical (basic compound, the amount of salt, nitrates, nitrites and other additives, qualitative and quantitative analyses of spoiled meat, by finding out of amines, amine etc.) microbiological (saprophytic, pathogenic and toxinogenic strains) methods, sometimes even physiological or biological tests. These last ones were shorttime only or with aimes to nutritional analyses.

Later by deeper analyses of smoke was proved how different mixture of substances exists during the pyrolysis. It is very specifically for the smoke process only, without analogy to other technological processes used in the food industry.

Together with Šula and Hopp we were looking for substances with a strong biological effect. In 1951 and later we pre-

ved by a fluorescens spectrography and by a biological test on rats (histologically confirmed), in strongly smoked meat and in tar of the smoking rooms carcinogenic substances, to be mere exact hydrocarbon 3,4 benzpyrene.

These analyses are very laborious and biological tests necessary for proving of all carcinogenic factors (not only 3,4 benzpyrene) take a long time (several months).

This necessary biological method had to be shortened without losing the reliability. That meant the proving of such changes in the bodys of rats which would be reliable signals of the begining of malignant growth.

In the work carried on with Šindelářová, when we analysed the blood of test rats, we elected methods of reduction of thionine, polarographical analyses, reaction with picric acid, electrophoretical analyses, the prove of number of red and white blood corpuscles, and determination of white blood picture.

We succeeded in determining starting values of healthy animals and values in the moment of the start of carcinogenic effect of substances on metabolism of rats.

The reduction test with thionine shows shorter time of 8 polarographic wave is higher of 2,7 mm, number of white blood corpuscles decreases substantially (of 4.500) and in the same time the number of segmented neutrofils increases twice and the body weight of rats decreases.

By these methods the biological test was possible to shorten for a period of few weeks only.

In the following tests together with Šatran and Rusz we tried to use also the gas chromatography, for the chemical analyses of smoking liquids. These liquids were supposed to substitute the smoking by wood smoke and were supposed to be without carcinogenic substances. In these liquids were found in greatest amount acetic acid, propionic acid, and least of isobutyric acid. Chemical analyses were comple-

ted by a shortened biological test and by determination of transaminas activity (G O T and G P T).

It proved, that the results were more favourable for soviet smoke liquid than for 3,4 benzpyrene, but worse then with the control animals.

Similar results were obtained even with our czechoslovak concentrated smoke liquid.

The described development of our analyses and the matters of carcinogenic effect of smoked meat products shows, that the technological processes are gradually compensating to the hygienical findings and demands.

Because of that, the use of the smoke liquids is more and more stressed lately, of course the economic motives play also a big part.

As an optimal smoke process we can recognize only that, which leaves in the smoke nearly all substances, except carcinogenic substances, which is not possible in the smoke liquids. Therefore we follow optimisticly the efforts after the filtrated or non-carcinogenic smoke.