Investigation the process of drying and ageing of raw-dried meat products from chopped meat,

a pulsating hydrodynamic regime of the drying agent ⁶, KARTELOV, K. VASSILEV

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Higher Institute of Food and Flavour Industries, 26 "Maritza" boul. 4002 Plovdiv, Eulgaria SUMMARY : The internal hydrodynamics in the climatic chamber is done by means of a cyc-Lic Capacity change of the fed drying agent, in its cross-section, by means of pressure air-Mipes. By means of a reversing valve, through a set period of time, the percent distribution Pation of the air stream is changed (a drying agent) which on its turn leads to speed change between the sausages in the climatic chambers cross-section. The hydrodynamic regime in the Aternal capacity of the climatic chamber, organized so far is the basic prerequisite for Rese-exchange processes intensification, shortening of the technological cycle and improve-Went the quality of the production. The object of investigation are the processes of drying and ageing of raw-dried meat products from choped meats, at a set heat-humidity, cyclingly thang of raw-dried meat products from one products (climate conditioned air). The re-^{vo} pulsating hydrodynamic mode of one day _____ of ^{vo} the experimental investigations in drying and ageing of meat products from choped ^{vo} the experimental investigations in drying and ageing of meat products from choped Weat in a cyclingly changing pulsating hydrodynamic regme of feeding in the internal capa-^{city} of the climatic chamber of a drying agent have been sxposed.

INTRODUCTION : At present, the drying agent circulation (the air streams with the set heat-humidity parametres - conditioned air) in the cross-section of the climatic chamers is to have by means of ceiling and floor positioned air-pipes. At that condition it is impossible to position uniformly the rack carts upon the floor, which on its turn disturbs the uniform drying agent circulation in the climatic chambers cross-section.

Whiform circulation of the drying agent on its turn is a prerequisite for the formation of another, /Corettik, 1974; of a Moisture-proof slayer (ring) in a given lot, damp-drying of another. /Corettik, 1974; ^{Aupati}, 1963/. The damp-proof ring makes more difficult the process of moisture diffusion trong to disturbing the optimum flowing the inner side to the surface of sausages and leads to disturbing the optimum flowing the of the technological processes - drying and ageing, i.e., it cannot be quarranteed and achie-Ves the necessary production quality in the whole capacity of the climatic chamber / Notter L.; 1973; Terplan G.; 1973/.

The purpose of the present word is to create such a distribution of the drying agent in the limet: Climatic chamber, by means of which the moisture diffusion outside should equilibrium in the Whole th ^{chamber}, by means of which the moisture all usion entering around th ^b ^o ^{chamber}, by means of which the moisture all usion of a damp-proof ring around th ^{chamber}, ^{cham} Its Production capacity, in that way avoiding the formation the process of drying. By Men. By means of the proposed decision for drying agent distribution in the climatic chamber, a company comparatively speedy field in sausages height is quarranteed in the given cross-section of the characteristic c the chamber.

Chara AND LETHODS : The system for ensuring the inner hydrodynamics in the climatic chamber is achieved by means of pressure and suction air-pipes, positioned on the ceiling. The Pulsating streams of the drying agent, fed in the climatic chamber capacity, are in a

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ratio 80 % to 20 %. The pulsating streams of the drying agent fed in the cross-section of th climatic chamber are realized from a main air-pipe with a valve, positioned on the cell^{inf} pressure air-pipes, with pressure nozzles, mounted on them, the schematic diagram of which ⁱⁱ shown on Fig. 1.

The homogenious but having a different speed streams of the drying agent, periodically char ging in the climatic chamber cross-section, in the process of drying and ageing, ensure the moisture remove from the production to take place in the following two stages : First Stage - in stream high apeed (80 %) of sausages, a remove of the surface moisture take place. The schematic diagram of the moisture removing mechanism from the sausages surface is shown on Fig. 2.

Second stage - in low stream speed (20 %) of sausages, the s.c. "rest" a moisture diffusion from the inside to the surface is done. The schematic diagram of the moisture diffusion mer chanism to the sausages surface is presented on Fig. 3.

In that way the drying agent feeding is periodically changed, by definite heat-moisture pare metres in the climatic chamber inner capacity, in the process of drying and ageing of raw dried meat products (sausages). In such a drying agent feeling into the climatic chamber, formation of a surface damp-proof ring formation is avoided.

Into an experimental climatic chamber a pulsating hydrodynamic drying agent mode is organized in the inner capacity, and some investigations have been carried out to raw-dried meat products, made from chopped meat, characteristic for our country.

The meat raw materials processing to the moment of placing the sausages into the drying age ing chamber, is done by using the established technology for the production of this type of meat products. The changes in the samples mass have been determined by weigning every day definite number of pieces from each lot set for investigation. we did a periodic control of the water content, too, by means of drying the samples until reaching a permanent weight in order to determine the end of the moment of drying for each lot.

RESULTS AND DISCUSSIONS : For "lukanka" "Panagjurska" the values for changing the mass and water content in the process of drying and ageing in a pulsating hydrodynamic drying _{pu} agent mode with heat-moisture parametres - temperaure from + 10°C to + 15 °C and relative midity 75 % + 85 % are presented on Table 1.

						TABLE 1		
Days for	Samples mass change in grams							
drying and	Sample	Sample	Sample	Sample	Sample			
ageing	1	2	3	4	5			
1	2	3	4	5	6			
First day Second day Third day Fourth day Seventh day	810 755 710 650 590	840 790 745 680 620	870 825 780 715 645	890 840 795 725 655	880 830 780 715 650			

The mass and water court tent values in the process of drying and age ing of "lukanka", of the type "Tarnovska" i a pulsating hydrodynes mode of the drying age

1	2	5	4	5	6	
Ninth day Yenth day	500	610	640	650	640	
	560	590	615	625	620	
Forenth	550	500	605	615	610	
Fourteenth day Pifteen day Sixteenth day	540	570	600	610	605	
Siveen da day	515	540	565 560	575 565	570 560	
Sixteenth day Seventeenth day Twenteenth day	500	530 525	550	555	550	
Wenteeth day	495	520	540	550	545	
Twenteenth day	485	510	535	540	540	
denty +1	470	490	520	525	520	
IWent ouird						
Da Vy to	465	485	510	520	515	
	460	480	505	515	510	
the Cont They	350	360	375	375	370	
troman average ample on the						
the on the			28 %			
H3 1	2	7	11	Tabl		
First day	2	3	4	5	6	
Second day Third day Fourth day	840	875	825	820	830	
Pourt day	785	820	780	775	780	
Fourth day Beventh day Lighth day	735	775	735	735	730	
13 outh ray	665 590	700 620	665 580	665 585	665 590	
Louid de	580	610	575	580	585	
N CO A	560	585	550	555	560	
Heventh day Pourteenth day	550	570	540	540	550	
Fourteenth day	545 500	565 530	530 495	535 500	540 505	
1	200	550	+ 7)	200	,0,	
Ri		2	3	4	5	6
Fifteen+1		2	3	4	5	6
Fifteenth day						
Fifteenth day Sixteenth day		495	520	485	490	500
Wenter day		495 485	520 510	485 479	490 480	500 490
Twenteenth day		495	520	485	490 480 470 465	500 490 480 475
Wenteenth day Wenty second	A.	495 485 475 470 450	520 510 500 490 470	485 479 465 460 440	490 480 470 465 450	500 490 480 475 455
Wenty third day Wenty second day Wenty third day Wenty third day		495 485 475 470 450 440	520 510 500 490 470 465	485 479 465 460 440 430	490 480 470 465 450 440	500 490 480 475 455 455
Wenteenth day Wenty second day Wenty third day Wenty fourth day Wean mass load	y	495 485 475 470 450 440 440	520 510 500 490 470	485 479 465 460 440	490 480 470 465 450	500 490 480 475 455
Wenteenth day Wenty second day Wenty third day Wenty fourth day Wean mass load	y	495 485 475 470 450 440 440	520 510 500 490 470 465	485 479 465 460 440 430	490 480 470 465 450 440	500 490 480 475 455 455
Wenteenth day Wenty second day Wenty third day Wenty fourth day Wean mass load	y	495 485 475 470 450 440 440	520 510 500 490 470 465 460	485 479 465 460 440 430 430 430 415	490 480 470 465 450 440 435 385	500 490 480 475 455 455 455 445
Wenteenth day Wenty second day Wenty third day Wenty fourth day Wean mass load	y	495 485 475 470 450 440 440	520 510 500 490 470 465 460	485 479 465 460 440 430 430 430 415	490 480 470 465 450 440 435	500 490 480 475 455 455 455 445
Twenteenth day Twenteenth day Twenty second day Twenty third day Wean mass loss f Water content of Sample on the 24	y	495 485 475 470 450 440 440	520 510 500 490 470 465 460	485 479 465 460 440 430 430 430 415	490 480 470 465 450 440 435 385	500 490 480 475 455 455 450 445 385
Wenteenth day Wenteenth day Wenty second da Wenty third day Wenty third day Weath sample each sample sample on the 24	y	495 485 475 470 450 440 440 440 400	520 510 500 490 470 465 460 415	485 479 465 460 440 430 430 430 415 <i>3</i>	490 480 470 465 450 440 435 385 3 % TABLE	500 490 480 475 455 455 455 455 445 385 385
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Intervention of the terms of the day function of the terms of terms	or each th d	495 485 475 470 450 440 440 400 ay 2 915	520 510 500 490 470 465 460 415 3 880	485 479 465 460 440 430 430 430 415 3 415 3	490 480 470 465 450 440 435 385 3 % TABLE 5 865	500 490 480 475 455 455 455 450 445 385 3. 6 875
Intervention day Intervention day Intervention day Intervention day Intervention day Intervention day Intervention day Intervention day First day Intervention day	Y Cor Ceach 	495 485 475 470 450 440 440 400 ay 2 915 870	520 510 500 490 465 460 415 3 3 880 845	485 479 465 460 430 430 430 415 3 415 3 415 3	490 480 470 465 450 440 435 385 3 % TABLE 5 865 820	500 490 480 475 455 455 450 445 385 3. 3. 6 875 830
Twenteenth day Twenteenth day Twenty second day Twenty third day deach mass loss f water content of sample on the 24	y Cor Cor Cor Cor Cor Cor Cor Cor Cor Cor	495 485 475 470 450 440 440 440 400 ay 2 915 870 830 755	520 510 500 490 465 460 415 3 880 845 805	485 479 465 460 430 430 430 415 3 415 3 415 4 8 70 830 795	490 480 470 465 450 440 435 385 3 % TABLE 5 865	500 490 480 475 455 455 455 455 455 445 385 3.
Twenteenth day Twenteenth day Twenty second day Twenty third day Wean mass loss f water content of sample on the 24	y Cor Cor Cor Cor Cor Cor Cor Cor Cor Cor	495 485 475 470 450 440 440 440 400 ay 2 915 870 830 755 675	520 510 500 490 465 460 415 3 880 845 805 735 655	485 479 465 460 440 430 430 430 415 3 415 3 415 4 870 830 795 725 640	490 480 470 465 465 450 440 435 385 385 3 % TABLE 5 865 820 785 720 640	500 490 480 475 455 455 455 445 385 3. 3. 6 875 830 785 720 650
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Interventh day Interventh day Interventh day Interventy second day Interventy third day Interventh day Interventh day Interventh day First day Interventh day Everth day Interventh day	y or 	495 475 470 450 440 440 400 ay 2 915 870 830 755 625 610 590	520 510 500 490 465 460 415 415 3 880 845 805 735 655 655 655 655 610 605 590 565	485 479 465 460 430 430 430 415 3 415 3 415 3 415 4 4 870 830 795 725 640 605 595 580 555	490 480 470 465 450 440 435 385 3 % TABLE 5 865 820 785 720 640 620 605 595 580 555	500 490 480 475 455 455 450 445 385 385 3.
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with the heat-moisture parametres - temperature + $10 + +15^{\circ}C$ and relative humidity 75 - 57%are presented in Table 2. For salami of the "hemus" type, the mass and water content change values in the process of drying and ageing in a pulsating hydrodynamic mode of the drying agent, with heat-moisture parametres of the medium $10 - 15 \,^{\circ}C$ and a relative humidity 75 - 85% are presented on Table 3.

<u>CONCLUSION</u> : On the basis of the results obtained from the hydrodynamic mode and pulsating mode of the drying agent utilization in the production of raw-dried sausages, we can draw the following conclusion : 1. The process of drying is intensified, in the investigated by us sample having obtained a finished product in the course of 24 days.

2. The formation of a surface damp-proof ring has not been determined.

3. The applied pulsating hydrodynamic mode of the drying agent is a prerequisite for improvement the quality of the finished product.

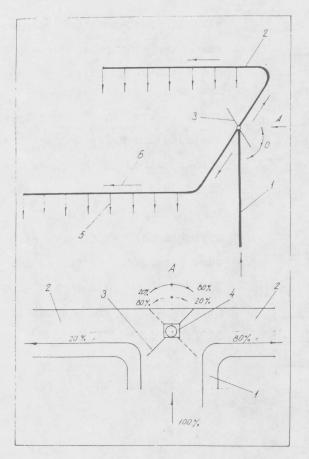


FIG. 1.

Schematic Diagram of the Pressure Air Pipe with the Regulating Valve :

- 1 main air pipe ;
- 2 pressure air-pipe ; left and right ;
- 3 valve ;
- 4 servomotor ;
- 5 6 directions of the fed drying agenti

FIG. 1

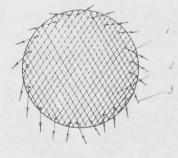


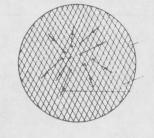
FIG. 2

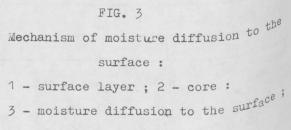
Mechanism for surface moisture from

the product cross-section : 1 - surface layer ; 2 - core ;

3 - surface moisture ;

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