A C T A A L I M E N T A R I A P O L O N I C A
Vol. VIII (XXXII), No. 3-4 1982

KAROL KRAJEWSKI
JACENTY STRĄK
JAN MROCZEK
ROMAN DOWIERCIAŁ

A RATIONAL PROCEDURE FOR HOT CUTTING PORK CARCASSES

Department of Food Technology, Agricultural University (SGGW-AR), Warszawa

Key words: hot pork carcasses, culinary meat, comminuted sausages

The rational procedure for utilization of hot pork carcasse in culinary meat and finely comminuted sausages was suggested. The positive manufacturing, qualitative and economic results were obtained.

The technology of hot meat production is a solution offering considerable savings of raw material and energy in the field of pork meat processing as well as lowering in manufacturing costs of products with the unchanged level of quality [3, 6, 7, 8, 9, 11, 14, 16]. The positive results of studies on the utilization of hot pork meat in production of pork butcher's meat products, canned meat and bacon [2, 3, 4, 9, 14, 16] making possible implementation of the above technology have been well known. The effectiveness of this practical application, especially in small meat plants — what is the best solution in Polish conditions [8] — requires, however, carrying the complementary studies on the process of culinary meat production from hot pork carcasses and on the rational utilization of the remaining parts of these carcasses.

The purpose of the study was examine the possibilities for the complete utilization of pork carcasses according to the technology of hot meat production in two directions — firstly for culinary meat and — secondly for finely comminuted meat products from the remaining meat.

MATERIAL AND METHODS

The studies were carried out in the "Żerań" Meat Plant in Warsaw using pork carcasses showing no symptoms of PSE meat (p. 6.3). From

right sides of carcasses, directly after slaughtering (45 min.), the *L. dorsi* muscles destined for further examination were cut out and higher valued cuts (ham and shoulder) removed. A choice of *m. L. dorsi* for studies was justified by its representativeness and accessibility [13]. Each of the cuts (ham and shoulder) removed. A choice of *m. L. dorsi* for studies was cooled in hanging position, whereas the other in lying position in the room at following parameters: RH 91%, air temperature 5°C and air velocity 0.7 m/sek. In the same conditions the control left-side carcasses were chilled. The remaining meat was utilized in manufacture of finely comminuted sausage acc. to the industrial standards [19]. The preground meat was then finely comminuted on a cutter with the addition of 2.2% salting and curing mixture and 50% of ice. The experimental batches were prepared replacing 5,25,45% of routinously used meat for comminuted sausages by the above mentioned emulsion. The diagram of the suggested way for utilization of hot pork carcasses is presented in fig. 1.

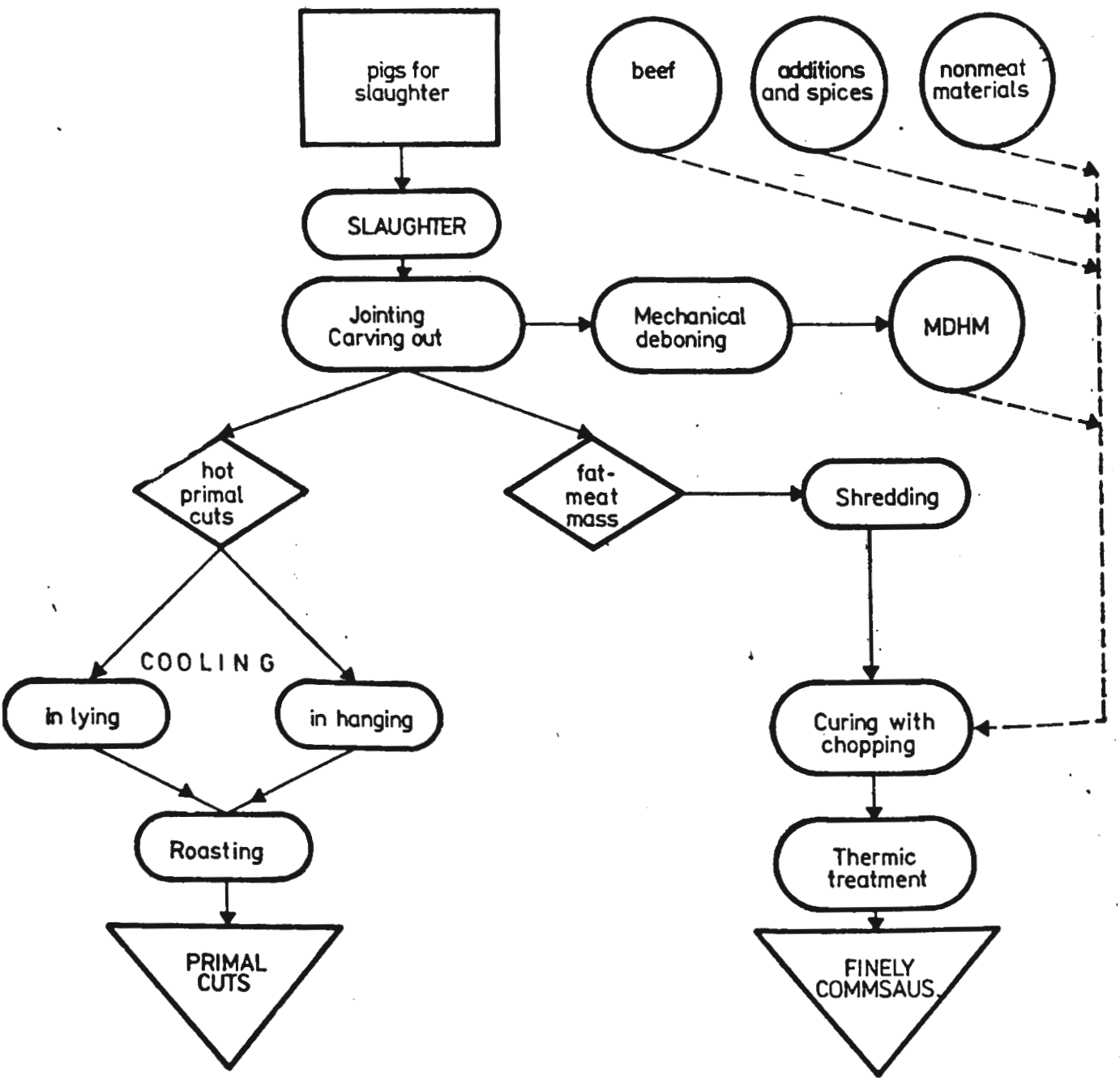

Fig. 1. Scheme of using hot pork carcases for production of primal cuts and finely comminuted sausages

Following determinations were performed:

— changes of temperature in muscles during chilling to the temp. +6°C (in geometrical centre of the sample),

— cooling losses,

— sensory quality (after standard roasting) i.e. colour, juiciness, tenderness, flavour,

— basic chemical composition, cooking loss, finely yield,

— using methods described elsewhere [1, 18, 19].

RESULTS AND DISCUSSION

The curve presented on the fig. 2 illustrates the drop of temperature measured in the core of the sample during curing. In the case of the hot deboned meat the required temperature 6°C was obtained after 6 and

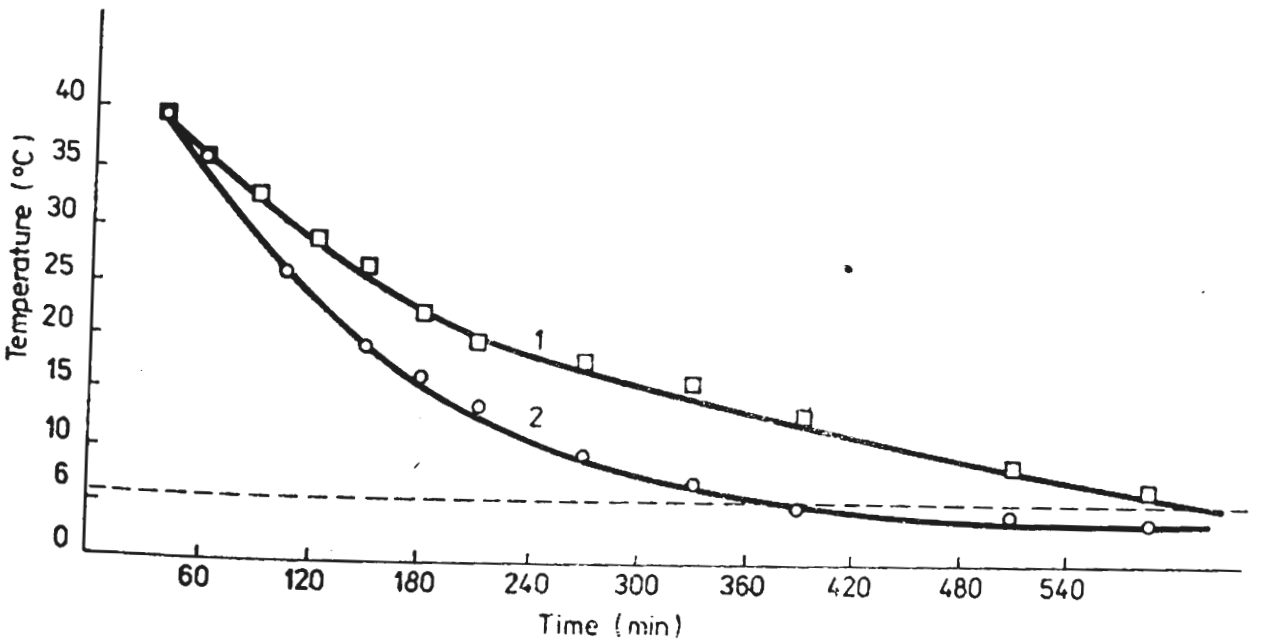

Fig. 2. Changing of temperature during cooling hot primal cuts; 1 — cooled loin without cutting from carcass, 2 — cooled loin from hot carcasses

half hrs, it means in the twice shorter time than in the case of the control. This can be easily explained by the more favourable exchange of heat in the deboned meat. However, the exposure of the hot meat caused almost 3.5 times higher natural losses during chilling, as it is seen on the fig. 3. The high level of natural losses may be limited by the optimization of chilling conditions and costs resulting from the losses may recompensated by the abbreviation of chilling cycle and more effective utilization of the indispensable chilling surface [10].

Generally experimental roasted samples had better sensory quality (fig. 4). Muscles chilled in the hanging position were preferred and all muscles obtained from hot carcasses were characterized by more desirable colour of meat and fat, higher juiciness and tenderness.

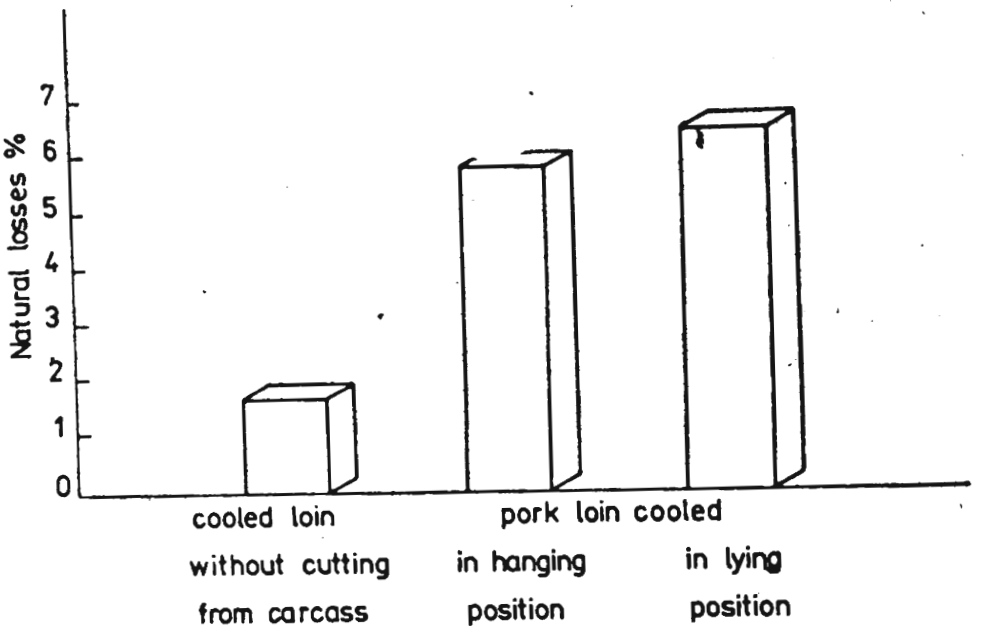

Fig. 3. Natural losses in hot pork loins cooling

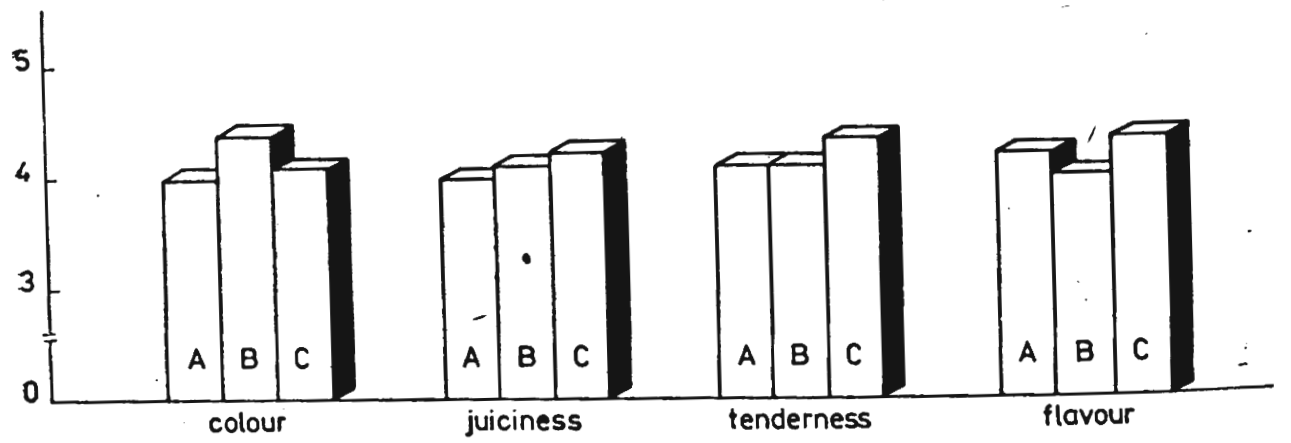

Fig. 4. Sensoric evaluation of hot primal cuts; A — cooled pork loin without cutting from carcass, B — pork loin cooled in lying position, C — pork loin cooled in hanging position

Table presents results about the manufacturing of finely comminuted sausage. The obtained values for: W/P, F/P, cooking losses and yield were within the limits of the industrial first-grade product. With the increase of the added emulsion prepared from hot meat, the slight rise in the value of W/P and F/P ratios as well as considerable increase of yield and evident lowering of thermal loss were observed. It was favorable from the viewpoint of technology and economics. The figure 5 presents the sensory evaluation. It was visible that the meat products manufactured with the addition of the emulsion prepared from hot meat were higher scored within all particular parameters i.e. colour, juiciness, and flavour in comparison to the control products. The meat products with the greatest addition of the emulsion were evaluated as the best ones. Summarizing it can be concluded the production benefits and the sensory quality justify developing of culinary hot pork technology with the immediate utilization of the remaining lower valued cuts for manufacturing of finely comminuted meat products.

Table. Technological characteristics of finelly comminuted sausages prepared with addition of hot fat-meat mass

Materials	Water/protein	Fat/protein	Thermal outflow %	Yield %
1. Sausage produced according to Polish standards	5.7 (6.9)	1.8 (4.3)	12.6	135 (133)
2. Sausage with addition of hot fat meat mass*:				
— 5%	6.4	1.6	11.7	138
— 25%	6.3	2.2	10.4	140
— 45%	6.5	2.8	9.2	141

* chemical composition of fat-meat mass: protein — 7.7%, fat — 59.0%, water — 32.8%

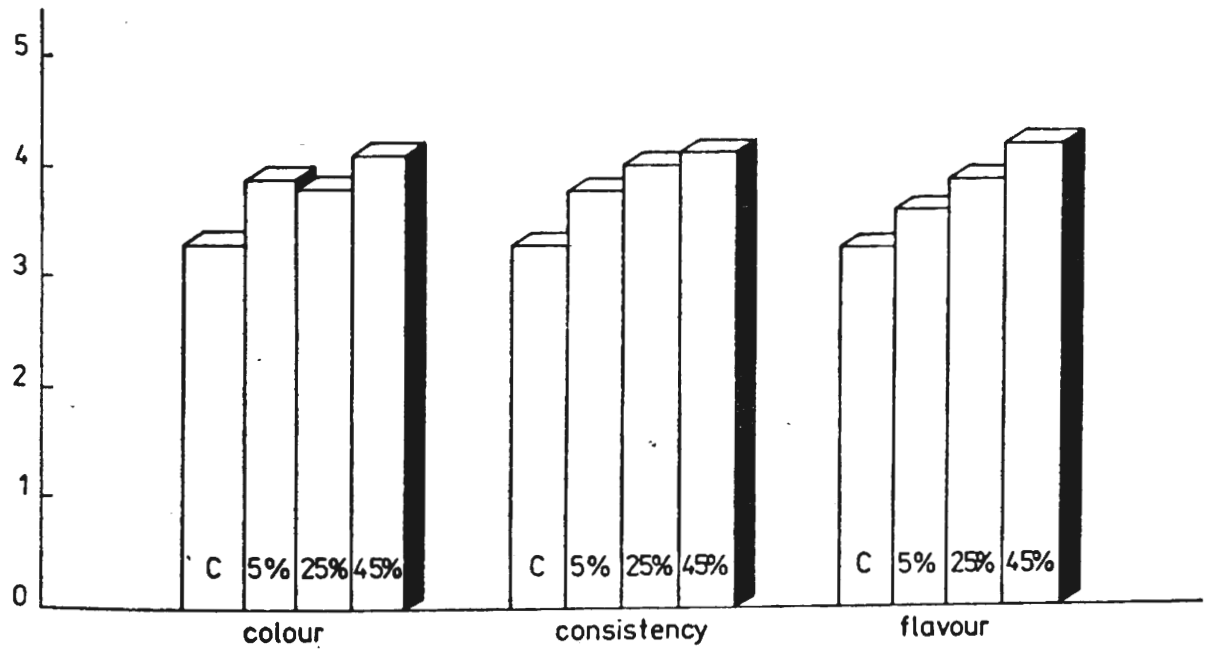

Fig. 5. Sensoric evaluation of finely comminuted sausage produced with addition of hot fat-meat mass; C — sausage produced according to Polish standards — control sausage, 25% — fat-meat mass addition

LITERATURE

1. Baryłko-Pikielna N.: Zarys analizy sensorycznej żywności, WNT, Warszawa 1975.
2. Cuthbertson A.: Meat, 1979, 4, 63.
3. Cuthbertson A.: Developments in meat science, No 1, edited by A. Lawrie, Applied Science Publishers Ltd London 1980.
4. Gawron S.: Gospodarka Mięsna 1978, **30**, 9, 15.
5. Hamm R.: Kolloidchemie des Fleisches, P. Parey Verlag Berlin und Hamburg 1972.
6. Harrington G.: Pres. before London Meat Trad. Symp. of New Tech. in the Abbatoir and Proc. Plant, London May 1978.
7. Henrickson R. L.: Proc. of the Meat Ind. Res. Conf. Amer. Meat Inst. Foundation, Arlington 1975, Va, 25.
8. Imbs B., Krajewski K.: Report to Int. Symp. Advances in Hot Meat Processing, Rydzyna 16-20.VIII.1981.

9. Kastner C. L.: Proc. of the Meat Ind. Res. Conf. Amer. Meat Inst. Foundation, Chicago 24-25.III..1977, 43.
10. Krajewski K., Brudka I., Karnafel W., Pisula A.: Unpublished paper Institute of Food Technology, SGGW-AR, Warszawa 1979.
11. Krajewski K., Mianowski Z., Kotowski Z.: Zeszyty Naukowe SGGW-AR w Warszawie, Technologia Rolno-Spożywcza, 15, in press.
12. Lawrie R. A., Pomeroy R. W., Cuthbertson A.: J. Agric. Sci., 1963, 2, 195.
13. Pełczyńska E.: Medycyna Weterynaryjna, 1975, 3, 170.
14. Pisula A.: Report to Int. Symp. Advances in Hot Meat Processing, Rydzyna 16-20.VIII.1981.
15. Pisula A., Górecka E., Abram A.: Gospodarka Mięsna, 1973, 9, 21.
16. Pisula A., Bożyk Z., Głowacki A., Klamut A.: Technologia mięsa wieprzowego ciepłego w produkcji przetwórczej, SGGW-AR, Warszawa 1976.
17. Pisula A., Mroczek J.: Badania nad zastosowaniem mięsa wieprzowego ciepłego w produkcji przetwórczej, SGGW-AR Warszawa, 1976.
18. PN-66/A — 04020.
19. Regulation No. 30 of 3rd Oct. 1977 given by Director of OPPMs in Warsaw.

K. Krajewski, J. Strąk, J. Mroczek, R. Dowiercial

RACJONALNE POSTĘPOWANIE Z WIEPRZOWINĄ KROJONĄ NA CIEPŁO

Instytut Technologii Żywności SGGW-AR, Warszawa

Streszczenie

W pracy przebadano przebieg procesu wychładzania elementów kulinarnych wykrojonych z tuszy wieprzowej bezpośrednio po uboju i wpływ tego procesu na jakość sensoryczną badanych elementów. Oceniono możliwości wykorzystania masy tłuszczowo-mięsnej peklowanej bezpośrednio po rozbiorze ciepłych półtusz do produkcji kiełbasy parówkowej. Badania przeprowadzono w warunkach Zakładów Mięsnych „Żerań" w Warszawie.

Badaniami objęto określenie:

— zmian temperatury w mięśniu *L. dorsi* w trakcie wychładzania na wisząco i na leżąco do temperatury 6°C w centrum mięśnia,

— wielkość ubytków naturalnych mięsa podczas wychładzania,

— jakości sensorycznej schabów i wędlin z dodatkiem mięsa ciepłego,

— wskaźników technologicznych otrzymanych wędlin drobnorozdrobnionych, w których 5, 25, 45% wsadu surowego zastąpiono masą tłuszczowo-mięsną peklowaną na ciepło.

Przeprowadzone badania wykazały korzystniejsze cechy sensoryczne schabów badanych w porównaniu z tradycyjnie otrzymanymi przy nieco wyższych ubytkach naturalnych podczas wychładzania. Ubytki te są jednak kompensowane znacznie krótszym czasem wychładzania i lepszym wykorzystaniem powierzchni produkcyjnych. Wędliny doświadczalne charakteryzowały się znacznie większą wydajnością oraz bardzo korzystnymi cechami sensorycznymi.

Badania wskazują na możliwość wprowadzenia technologii mięsa ciepłego do produkcji wieprzowych elementów kulinarnych z jednoczesnym racjonalnym wykorzystaniem pozostałych elementów i części półtusz do produkcji wędlin drobnorozdrobnionych.