THE USE OF THE "MEAT VALUE" CONCEPT FOR ASSESSMENT OF QUALITY AND RENTABILITY

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INTRODUCTION

As it was reported at the meat congress in 1987, a new concept called "meat value"has been introduced in order to characterize the effective value of raw materials/1/.

The "meat value" is related to the most important properties of the raw materials:
  -nutritional characteristics
  -technological applicability
  -properties influencing the sensoric characteristics of the final product.

The above mentioned properties are connected with the proportion, structure and size of different types of tissues existing in the meat cuts or other raw materials.

The relative score of the "meat value" of different raw materials furnishes a good basis of comparison for quality and rentability.

The "meat value" is determined by expert's panels, with the help of special algorithms.

This method gives the effective value of the corresponding raw material,so it is also suitable for the control of the yield of the deboning process.

Special indices were elaborated for the assessment of the quality of carcase, of the accuracy of the technological process, and for the analysis of the rentability of production.

MATERIALS AND METHODS

Cuts obtained by the deboning of porc has been examined /Leg and loin/.

The calculations were carried out with the help of the normative yield, with the weight obtained from the deboning experiments, and with the "meat value" of the materials.Special indices were made with the help of "meat value" balance.

RESULTS

The following types of raw materials were obtained:

    P - principal product
        /e.g.boneless loin/
    T - trimmings
    F - fatty tissue and fatty
        trimmings
    O - other cuts /e.g.hocks/
    B - bones

Results are shown in tables 1-6, presenting the sums of the masses for each type of material, and the cumulated values of the meat value scores. /normative,and actual experiments/.

$$E.g.\ G_F = \Sigma G_{F_i}$$

where G_F is the mass of fatty materials /fatty tissue, fatty trimmings, bacon/.

The rentability of the whole process is given by the following formula:

$$V\% = \frac{\Sigma V_A}{\Sigma V_N}$$

where V% is the index of rentability N is the mean of the normative,and A the mean of the actual process.

The different types of raw materials are influencing the meat value balance according to their effective value.

It is evident, that the index of rentability is very sensitive to the quality, i.e. to the effective value of the raw materials.

The cumulative values coming from several types of raw materials give detailed information on the quality of the meat parts and on the accuracy of the technology.

For this reason, special indices were elaborated from these values:

    /1/ $G_P / \Sigma G$
    /2/ $G_F / \Sigma G$

    /3/ V_P / V_T
    /4/ $V_P / V_T + V_F + V_B$

$$/5/ \quad V_F/V_P+V_T+V_B$$

etc.,

where G: mass
V: cumulative meat value
P: principal product
T: trimmings
F: fatty tissue
B: bones

Concerning the applicability of these indices, some examples are presented here:

Example 1 /see table 1/

The cumulative value of the principal product decreases /index"a"/, the proportion of the bones increases /b/ and that of the fatty tissue remains approximately constant /c/:

	norma-tive	actual	per-centage
/a/ $V_P/V_T+V_F+V_B$	7,66	6,84	89,3 %
/b/ $G_B/\Sigma G$	7,7	1o,2	132,4 %
/c/ V_F	43o,3	442,o	1o2,7 %

The change of the indices in that example shows, that the leg originates from porcs with underdevelopped musculature.

Example 2 /table 5/

The proportion of the principal product, of the trimming and of the bones decrease /a,b,c/, however, that of the fatty tissue /d/ increases:

	norma-tive	actual	per-centage
/a/ $V_P/V_T+V_F+V_B$	3,37	2,84	84,2 %
/b/ V_T/V_F	7,98	5,34	66,9 %
/c/ $G_B/\Sigma G$	15,o	13,o	86,6 %
/d/ V_F	1295,9	1461,6	112,7 %

The above situation is characteristic for the effective value and for the quality of the meat parts originating from fatty animals.

Example 3 /table 3/

The rate of meat trimmings is high compared to the main product /a/, as well as the bone content with meat residuals, too /b/.

	norma-tive	actual	per-centage
/a/ V_P/V_T	12,2	9,5	78,2 %
/b/ bones with meat resid.	1,5	1,7	113 %

In this example the shaping of the principal product was too excessive, the amount of trimmings increased, and more meat remained on the bones. All these problems are related to the accuracy of the technology.

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It is advisable to control visually the deboning process. E.g. the proportion of bone can be higher not only because of the higher proportion of meat residues on it, but also because of the stronger skeleton of the animal.

It is necessary to prepare the balance with the help of the indices just after deboning, in order to detect eventual technological mistakes.

Further collection of data is necessary to introduce this concept into the everyday practice. Computer program will be elaborated for industrial use.

CONCLUSION

The concept of meat value seems to be a valuable tool for the assessment of rentability and quality and for the control of technological processes.

REFERENCE

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Table 1   Principal product: boneless raw ham

	NORMATIVE G	NORMATIVE V	ACTUAL G	ACTUAL V	DIFFERENCE G	DIFFERENCE V
P	51,5	9373,0	47,8	8699,6	− 3,7	− 673,4
T	7,7	770,0	8,0	800,0	+ 0,3	+ 30,0
F	33,1	430,3	34,0	442,0	+ 0,9	+ 11,7
B	7,7	22,5	10,2	28,5	+ 2,5	+ 6,0
ΣV		10595,8		9970,1		− 625,7
ΣV%		100,0		94,0		

G: mass, kg
V: meat value, cumulated

P: principal prod.
T: trimmings
F: fatty tissue
B: bones

Table 2   Principal product: boneless raw ham

	NORMATIVE G	NORMATIVE V	ACTUAL G	ACTUAL V	DIFFERENCE G	DIFFERENCE V
P	51,5	9373,0	47,3	8608,6	− 4,2	− 764,4
T	7,7	770,0	7,1	710,0	− 0,6	− 60,0
F	33,1	430,3	38,4	499,2	+ 5,3	+ 68,9
B	7,7	22,5	7,2	19,5	− 0,5	− 3,0
ΣV		10595,8		9837,3		− 758,5
ΣV%		100,0		92,8		

Table 3   Principal product: boneless raw ham

	NORMATIVE G	NORMATIVE V	ACTUAL G	ACTUAL V	DIFFERENCE G	DIFFERENCE V
P	51,5	9373,0	49,7	9045,4	− 1,8	− 327,6
T	7,7	770,0	9,5	950,0	+ 1,8	+ 180,0
F	33,1	430,3	33,0	429,0	− 0,1	− 1,3
B	7,7	22,5	7,8	25,5	+ 0,1	+ 3,0
P+T	59,2	10143,0	59,2	9995,4	−	− 147,6
FT*	29,5	383,5	29,3	380,9	− 0,2	− 2,6
MB*	1,5	22,5	1,7	25,5	+ 0,2	+ 3,0
ΣV		10595,8		10449,9		− 145,9
ΣV%		100,0		98,6		

* FT: fat trimmings
  MB: meaty bones

Table 4   Principal product: boneless loin

	NORMATIVE		ACTUAL		DIFFERENCE	
	G	V	G	V	G	V
P	33,3	6993,0	30,2	6342,0	− 3,1	− 651,0
T	5,5	550,0	5,7	570,0	+ 0,2	+ 20,0
F	46,2	1295,9	46,1	1279,3	− 0,1	− 16,6
B	15,0	225,0	18,0	270,0	+ 3,0	+ 45,0
ΣV		9063,9		8461,3		− 602,6
ΣV%		100,0		93,3		

Table 5   Principal product: boneless loin

	NORMATIVE		ACTUAL		DIFFERENCE	
	G	V	G	V	G	V
P	33,3	6993,0	29,2	6132,0	− 4,1	− 861,0
T	5,5	550,0	5,0	500,0	− 0,5	− 50,0
F	46,2	1295,9	52,8	1461,6	+ 6,6	+ 165,7
B	15,0	225,0	13,0	195,0	− 2,0	− 30,0
ΣV		9063,9		8288,6		− 775,3
ΣV%		100,0		91,4		

Table 6   Principal product: boneless loin

	NORMATIVE		ACTUAL		DIFFERENCE	
	G	V	G	V	G	V
P	33,3	6993,0	31,6	6636,0	− 1,7	− 357,0
T	5,5	550,0	6,0	600,0	+ 0,5	+ 50,0
F	46,2	1295,9	46,2	1289,1	−	− 6,8
B	15,0	225,0	16,2	243,0	+ 1,2	+ 18,0
P+T	38,8	7543,0	37,6	7236,0	− 1,2	− 307,0
FT*	5,3	68,9	5,7	74,1	+ 0,4	+ 5,2
MB*	15,0	225,0	16,2	243,0	+ 1,2	+ 18,0
Σ V		9063,9		8768,1		− 295,8
Σ V%		100,0		96,7		

*FT: fat trimmings
 MB: meaty bones