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System inaccuracy bolometric components to determine elimination procedures in the process of thermal translocation liver living biological material

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Abstract. Scientific document primarily describes the functionality of the principles of regression methods to determine the time of death and at the same time appreciating method used Henssgeho nomogram. Part of the document suggest application process statistically measurement in a process algor mortis and in the same time determining the measurement uncertainty of the process of translocation of material sensed temperature fields in the hepatic parenchyma. Evaluation of measured values for the determination of the correction factor of the material used there to define errors incurred in the process of research evaluation. Analyze the errors are drawn conclusions, leading to particularized elimination processes, which are used to determine the time of death polynomial regression method, and thus leads to propose strategic measures for practical application usage.

Introduction

Scientific document describes laboratory conditions and evaluate the results. Results of this science document are determination errors, which were detected in process evaluation temperature of correction factor. This process will be analyses and proposes eliminating process.

Laboratory conditions

Part of the work laboratory conditions analytically evaluate conditions in the presence of which was transferred to laboratory measurements. After analyzing the conditions are to stage a recovery concluding, that the examination has been detected.

Air temperature: (20,9- 22,5 °C), filtered: 15-35°C, measured area: liver parenchyma

Table 1 Description of the basic parameters of samples tested

Number of sample	Weight [kg]:	Gender:	Age:
1	73	Male	19
2	76	Female	22
3	74	Male	19
4	95	Male	19
5	110	Male	20
6	76	Male	20
7	72	Female	20
8	85	Male	20
9	85	Male	19
10	75	Male	19

11	**74**	**Male**	**20**
12	**85**	**Male**	**20**
13	**82**	**Male**	**20**
14	**85**	**Male**	**22**
15	**78**	**Male**	**22**
16	**78**	**Female**	**21**
17	**90**	**Male**	**23**

Material properties of the correction material

Each of these samples of the material has characteristics that affect the temperature measurement of liver. During thermal translocation occurs to influence the heat transfer through the material correction, and with the assistance of the characteristics of the individual substances. From the examination of materials have been identified following characteristics. In the event that there is only partial, or only partially describing the various materials, the exploration of passages would not be sufficiently reliable, and consequently giving standardized characteristics, leading to the formation of defects in the evaluation. Samples of materials are included in the group of thin materials, which are primarily used to overlap the body in ideal temperature conditions of the external environment, which leads to ideal body condition in live biological man, that is not present burden on the body. A material property of the differential table lists the basic properties of the material.

Table 2 Material properties

Type of material	Material thickness [mm]	Structure
Yellow cotton	1,5	The dense structure
Green colored wool fibers	2	Loose structure of coarse fibers
Shade of red cotton	1	The dense structure of fine fibers
Black patterned cotton	0,7	The dense structure of fine fibers
Thick brown wool	10	The dense structure of two layers of thick filaments
Brown and black cotton blended with polyester	1	Thin structure fine fibers
Red satin and polyester	0,5	Thin structure fine man-made fibers

Material properties are shown in the thickness of one layer, but when measured using two types of measurement, and the measurement of one layer, and after some time thermoregulation layers there are two layers of a single material. Those materials are visually shown in the following figure. In terms of color are selected in different range of colors, because of the examination of a number of characteristics belonging to the primary separation of cotton and wool with an appropriate amount of artificial substances polyester. The composition is present in the majority of textile materials are being used under normal conditions.

Fig. 1 Samples of materials used as overlapping sensing area

Random errors determined by calculating

To determine the measurement error, was used in the calculations temperature measured on several samples of biological material for the determination of the correction factor of the material used. The measured values were determined the most probable value, which is represented by the arithmetic mean of the measured values and the number of samples simultaneously is considered the most likely value for the next real value of the measuring.

$$\Delta X = Xi - \overline{X} \tag{1}$$

Eq.1: Absolute error

$$\Delta Vi = Xi - \overline{X} \tag{2}$$

Eq.2: The most probable error

$$\overline{X} = \frac{\sum_{i=1}^{n} X_i}{n} \tag{3}$$

Eq.3: The sum of the most probable error zero-arithmetic average

Measured is identified and measured value of the absolute error, which was mathematically determined. To determine the accuracy of the measurement is to be considered the most likely value, and the relative error.

$$X = \overline{X} \pm \Delta X \tag{4}$$

Eq.4: Representation of the measuring

$$\delta X = \frac{\Delta X}{\overline{X}}.100\% \tag{5}$$

Eq.5: The relative error [%]

The primary task was to evaluate abnormalities measurements which were eligible for use in the analysis. If the value is evaluated as the maximum error but it did not allow its subsequent analysis and inclusion in the most probable range of values was selected the most likely value of the scanning area, and it was subjected to further examination and statistical calculations.

Table 3: Evaluation of results

MATERIAL	**assessment of the average value [°]**	**primary measured mean value [°]**	**absolute error**	**relative deviation**	**correction factor**
without material	34,47	34,54	0,075	-	-
brown easily one layer	26,64	26,77	0,135	0,51	1,037
easy two layers of brown	29,13	29,28	0,155	0,53	1,07
red one layer of polyester	27,44	27,94	0,5	1,82	0,91
easy two layers of polyester	28,48	28,75	0,271	0,95	0,98
red cotton one layer	28,1	28,36	0,267	0,95	0,96
two layers of red cotton	25,97	26,30	0,339	1,31	0,96
green cotton one layer	22,62	24,46	1,842	8,15	0,86
two layers of green cotton	30,38	32,03	1,650	5,43	1,14
yellow cotton one layer	25,43	27,27	1,843	7,25	1,0
two layers of yellow cotton	28,64	27,15	- 1,49	- 5,20	1,20
black cotton one layer	31,84	32,51	0,675	2,12	1,09
two layers of black cotton	30,95	32,35	1,4	4,52	1,12
brown coarse wool two layers	25,69	30,1	4,413	17,18	1,35

Measurements were transferred using cameras Thermo Pro TP8, and data were analyzed using a proven program Guide IR analyzer. The verification data were found abnormal readings, which occurred in the presence of measurement error, which is identified in the present work.

The methodology of the evaluation process

The methodology of the evaluation process is provided for the process of eliminating the negative evaluation of information sources that cause deterioration and lack of measured values obtained in studies on exposure correction material for thermo regulatory process in the liver parenchyma. The points of the evaluation process are described in the following figure.

Achieve ideal conditions, the role of the assessment process. Identifying errors in the evaluation occurs feedback in the process of survey data for further measurements. In case of negative results is regarded as a positive feedback, because of the design of strategic change that will accurately determined in the process of research evaluation, will subsequent removal of disturbances, and thus there is a further explanation of aspects.

References

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