APPENDIX 5: EASY CALIBRATION OF THE MILK ANALYSER BY CALCULATING THE BASIC PARAMETERS VIA FORMULAS

DETERMINATION OF THE BASIC PARAMETERS IN THE MILK SAMPLE BY USING FORMULAS IS NOT AS PRECISE AS USING THE ARBITRARY METHODS, BUT IS SUITABLE FOR USAGE IN FIELD WORK.

5.1. Determination some of the parameters by formulas

There is dependence between the different parameters in milk and its density, which may be expressed with mathematical equation. On this base different formula, tested and confirmed by the classical laboratory methods for analyses, are developed. We recommend the following:

5.2. SNF determination.

For determination of SNF the correlation dependence exists between the milk's density, fat and SNF in the milk. When the density and the fat are known, the SNF can be calculated.
There are several formulas with different applicability.

A/ When the salts and fat are known
SNF is calculated by subtracting the fat percentage from the salts.
$$SNF = Salts - F \ (\%)$$
Where
Salts – salts in (%),
F   – fat content in (%),
This formula is used for determination of SNF in whey, buttermilk, and cream.

B/ Known quantity of fat and density (most commonly used method when maximum accuracy is needed).
We recommend the following formula:

$$SNF = \frac{0,075 * F\% + 100 - 100/density}{0,378}$$

This is a universal formula and actual for milk of almost all kind of cows and sheep all over the world.

5.3. Determination of lactose content
We recommend the following formulas:

A/ for cow milk

Lact. = SNF * 0,55 (%)

Where

SNF   – content of SNF in percentages (%),

0,55   – constant coefficient.

B/ for sheep milk

Lact. = SNF* 0,45 (%)

Where

SNF   –solids-non-fat content in percentages (%),

0,45   – constant coefficient.

This is an actual coefficient for sheep breeds on the territory of the Balkan Peninsula.

5.4. Determination of salts content
We recommend using the following formulas:

A/ for cow milk

Salts = SNF* 0,083 (%)

Where

SNF   – solids-non-fat content in percentages (%),

0,083   – constant coefficient.

B/ for sheep milk

Salts = SNF * 0,075 (%)

Where

SNF   – solids-non-fat content n percentages (%),

0,075   – constant coefficient.

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This is an actual coefficient for sheep breeds on the territory of the Balkan Peninsula.

5.5. Determination of total proteins content
We recommend using the following formulas:

A/ for cow milk

$$Protein = SNF * 0,367 (\%)$$

Where
SNF   - solids-non-fat content in percentages (%),
0,367   – constant coefficient.

B/ for sheep milk

$$Protein = SNF * 0,475 (\%)$$

Where
SNF   – solids-non-fat content in percentages (%),
0,475   - constant coefficient.

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This is an actual coefficient for sheep breeds on the territory of the Balkan Peninsula.