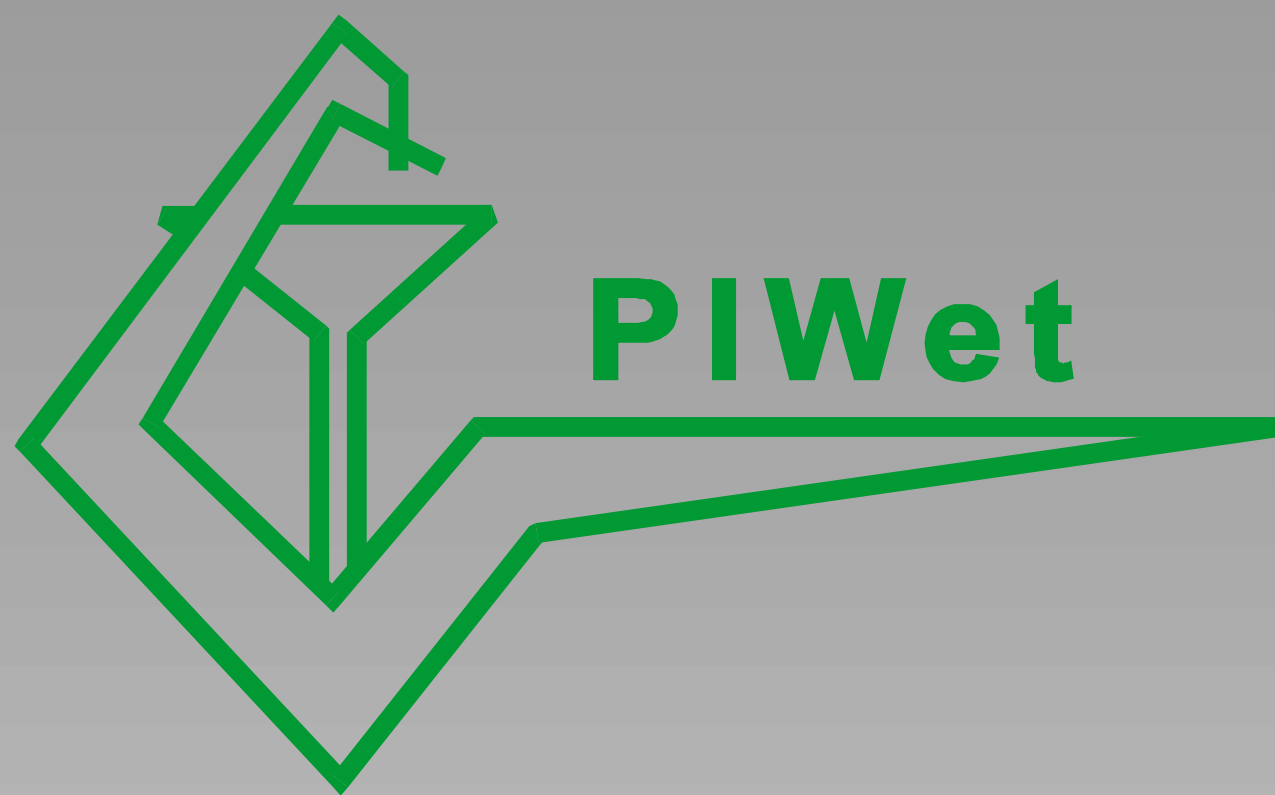
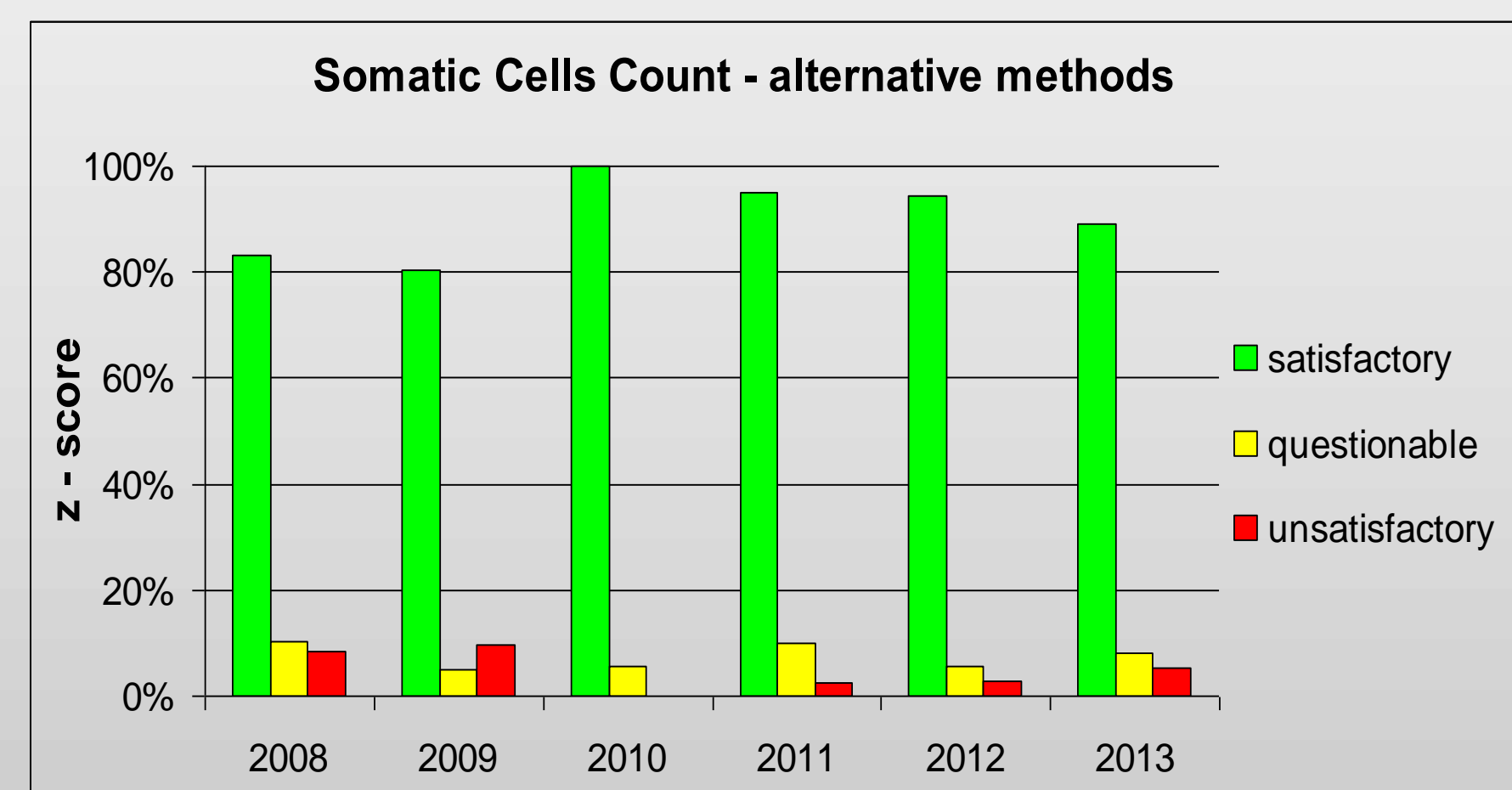
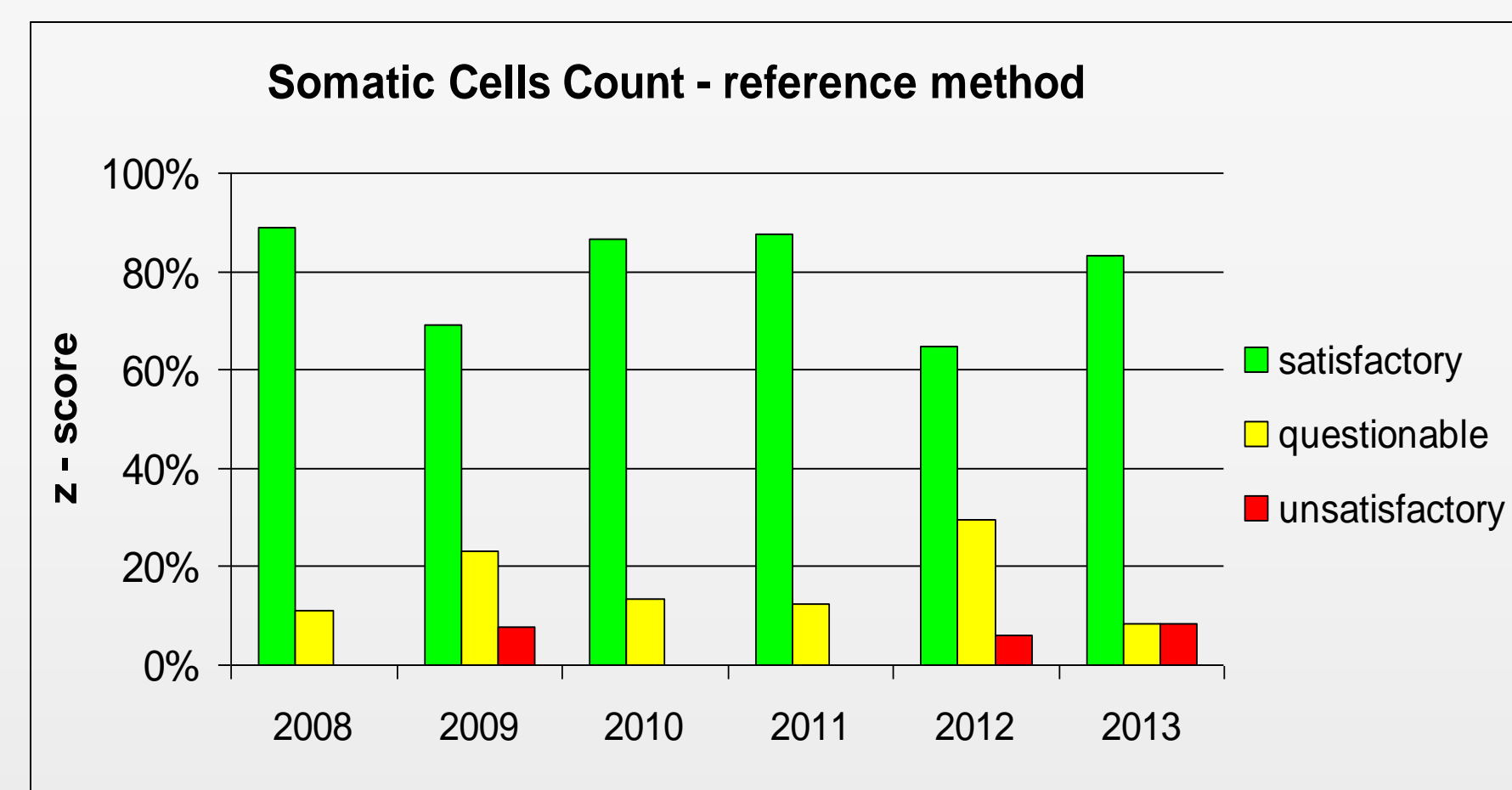
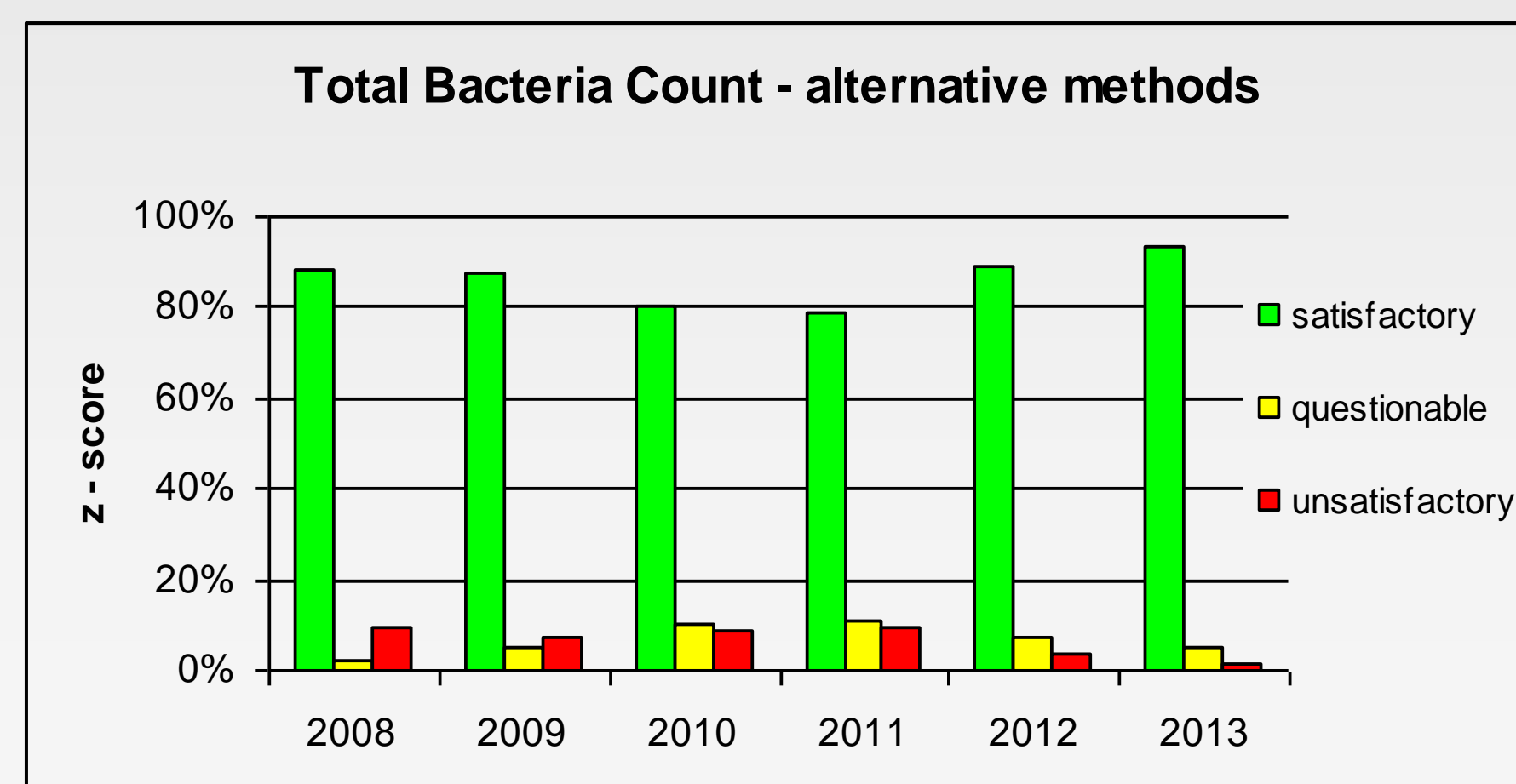
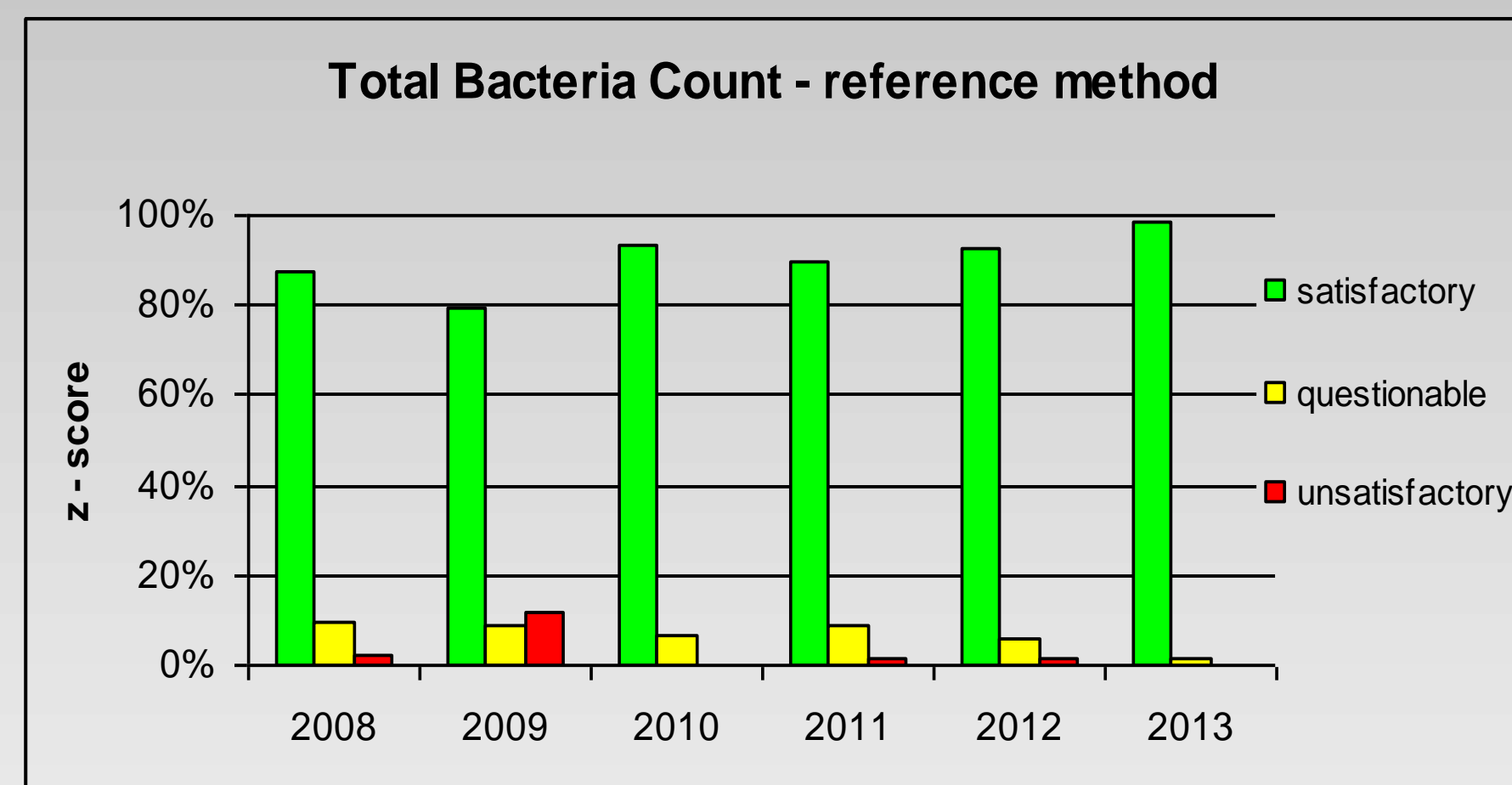


Proficiency testing in hygiene of raw milk: enumeration of total bacteria count and somatic cells count



Jolanta G. Rola, Maciej Sosnowski, Piotr Kostrzewa, Jacek Osek
National Veterinary Research Institute, Pulawy, Poland
Department of Hygiene of Food of Animal Origin
e-mail: jolarola@piwet.pulawy.pl

In Section IX of EC Regulation 853/2004, hygienic criteria have been fixed for raw milk (Chapter I, III). They include microbiological criteria on plate counts at 30 °C and number of somatic cells. The EC Regulation 2074/2005 includes the description of reference testing methods as well as condition for the use of alternative methods. This poster presents organisation of proficiency testing program of the official control laboratories performing microbiological and cytological examinations of raw milk. The presented result concern the proficiency testing trials organized in years 2008 – 2012.



PT organization

- ISO/IEC 17043:2010 Conformity assessment - General requirements for proficiency testing
- ISO/TS 22117:2010 Microbiology of food and animal feeding stuffs - Specific requirements and guidance for proficiency testing by interlaboratory comparison
- ISO 13528:2005 Statistical methods for use in proficiency testing by interlaboratory comparisons

Homogeneity checks of samples

- W_t - between-test-portion ranges $W_t = (x_{t1} - x_{t2})$
- S_x - standard deviation of sample averages $S_x = \sqrt{\sum (x_{it} - x_{..})^2 / (g-1)}$
- S_w - within-samples standard deviation $S_w = \sqrt{\sum W_t^2 / 2g}$
- S_b - between-sample standard deviation $S_b = \sqrt{S_x^2 - (S_w^2 / 2)}$
- Assessment of homogeneity $S_b \leq 0,3 \times \sigma$

Stability checks of samples

- $x_{..}$ - general average of results (homogeneity)
- $y_{..}$ - general average of results (stability)
- σ - standard deviation for proficiency testing

Assessment of stability $|x_{..} - y_{..}| \leq 0,3 \times \sigma$

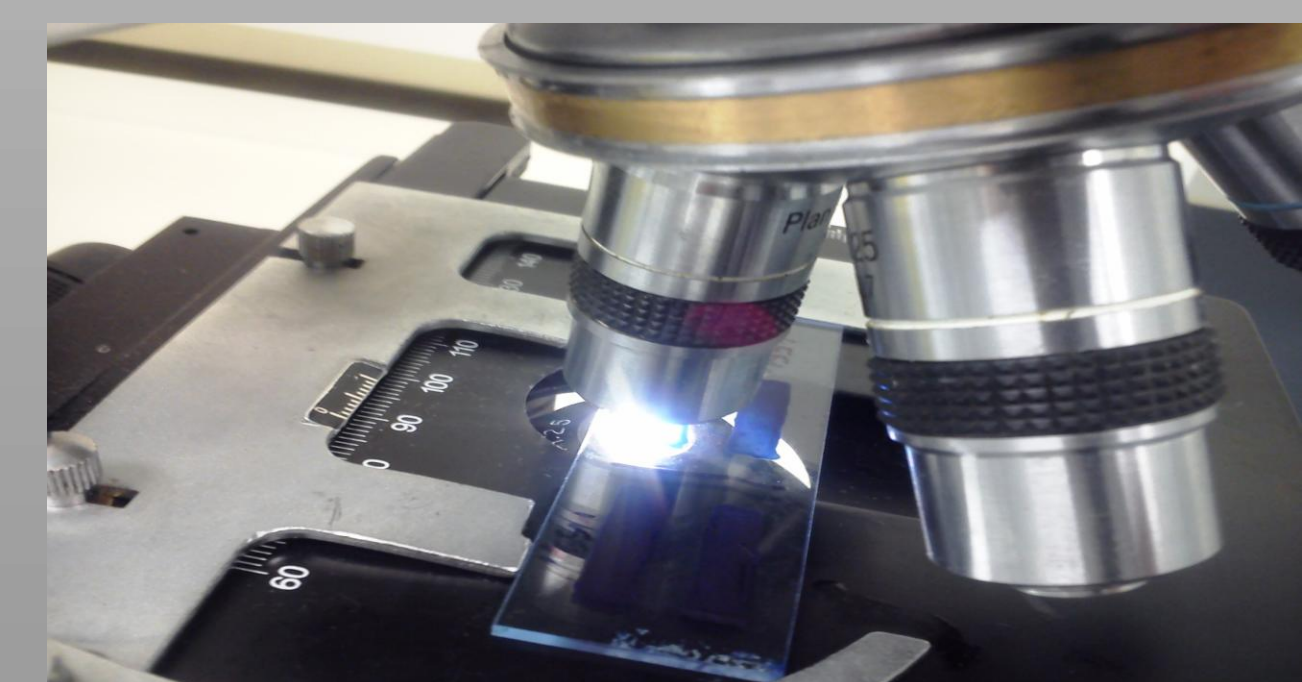
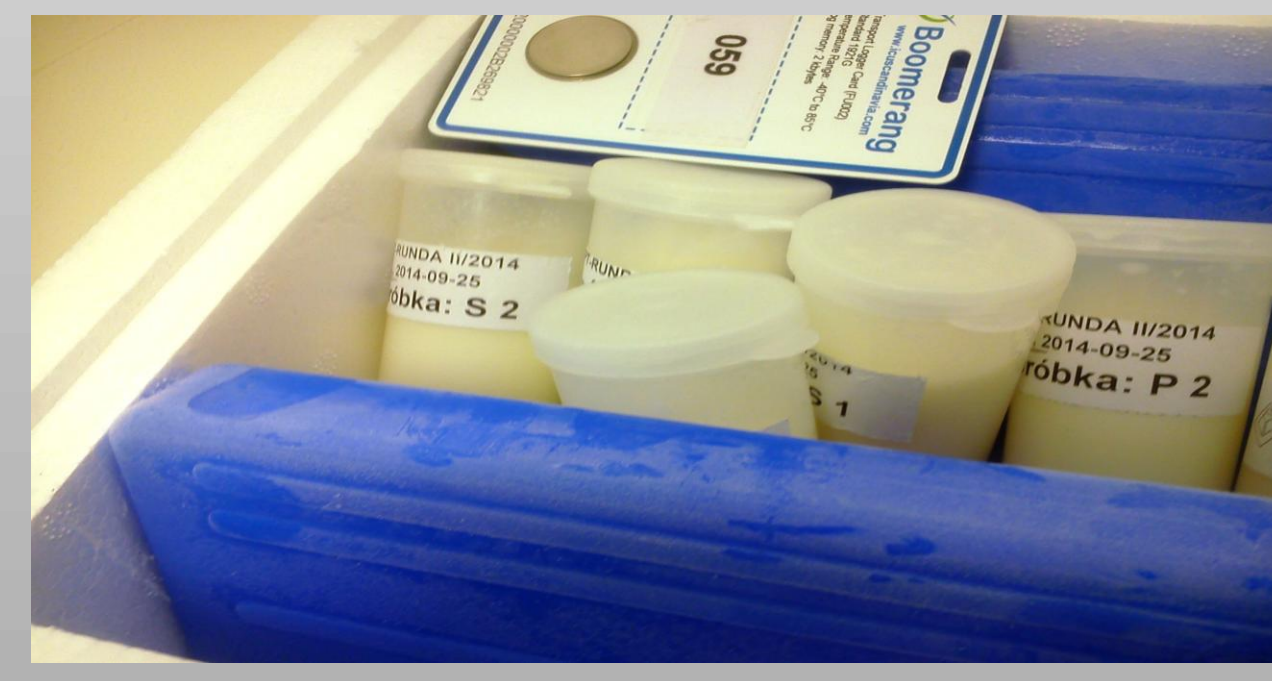
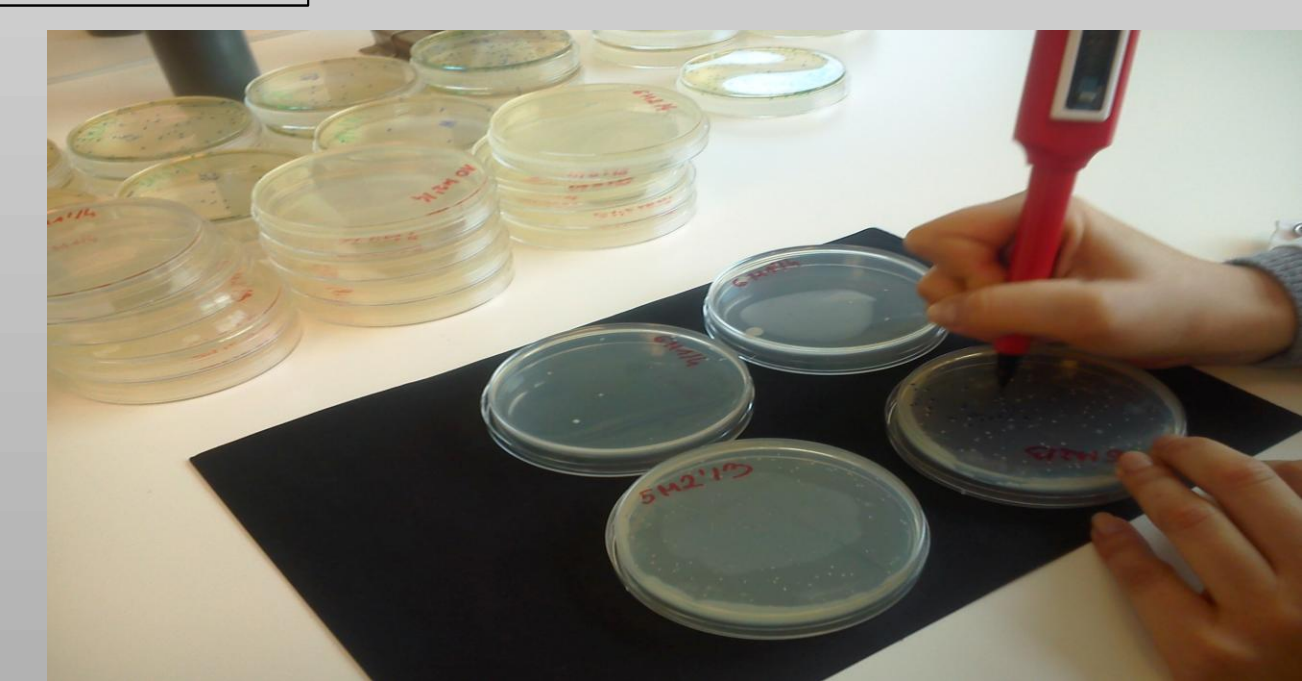
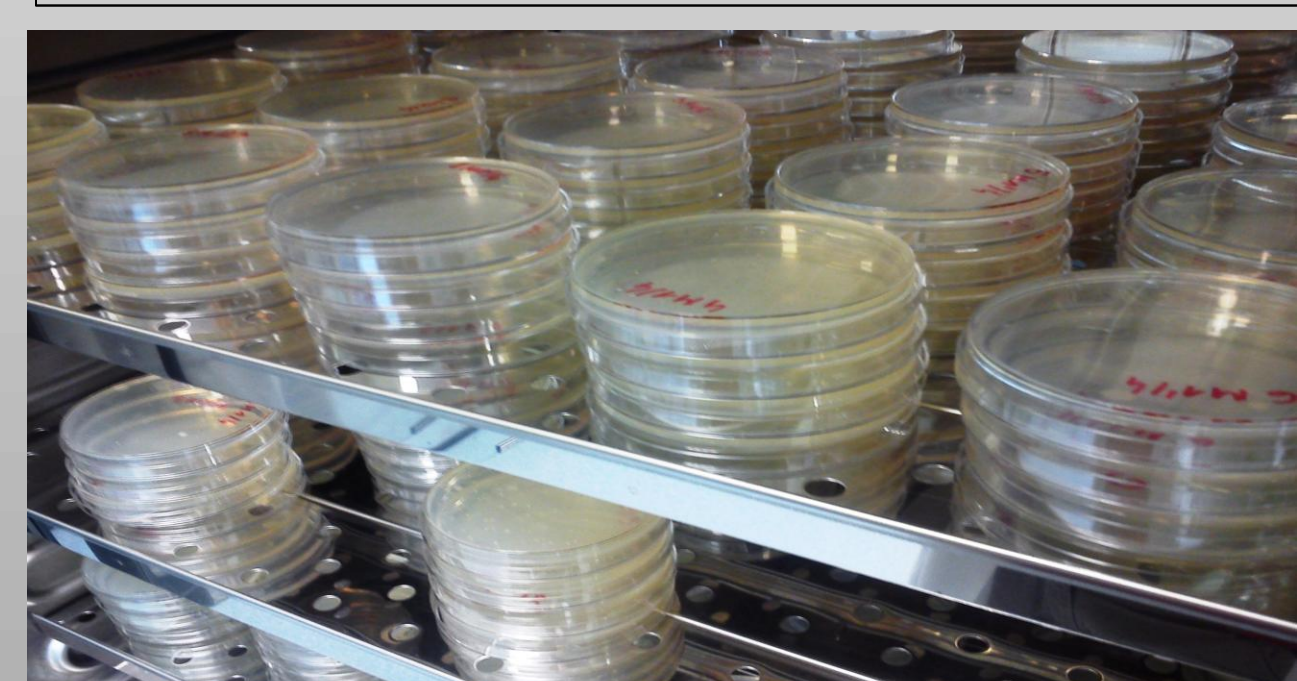
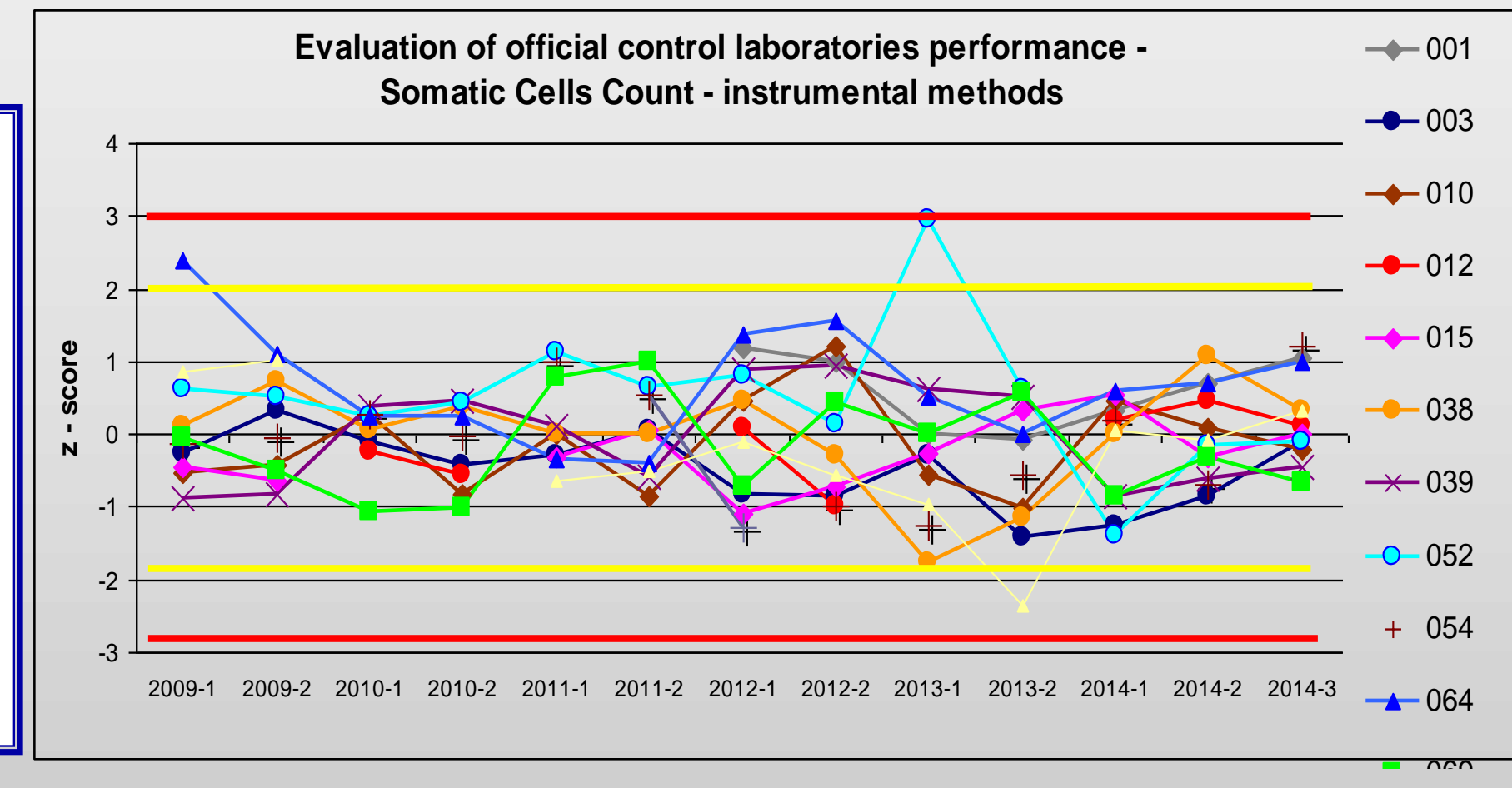
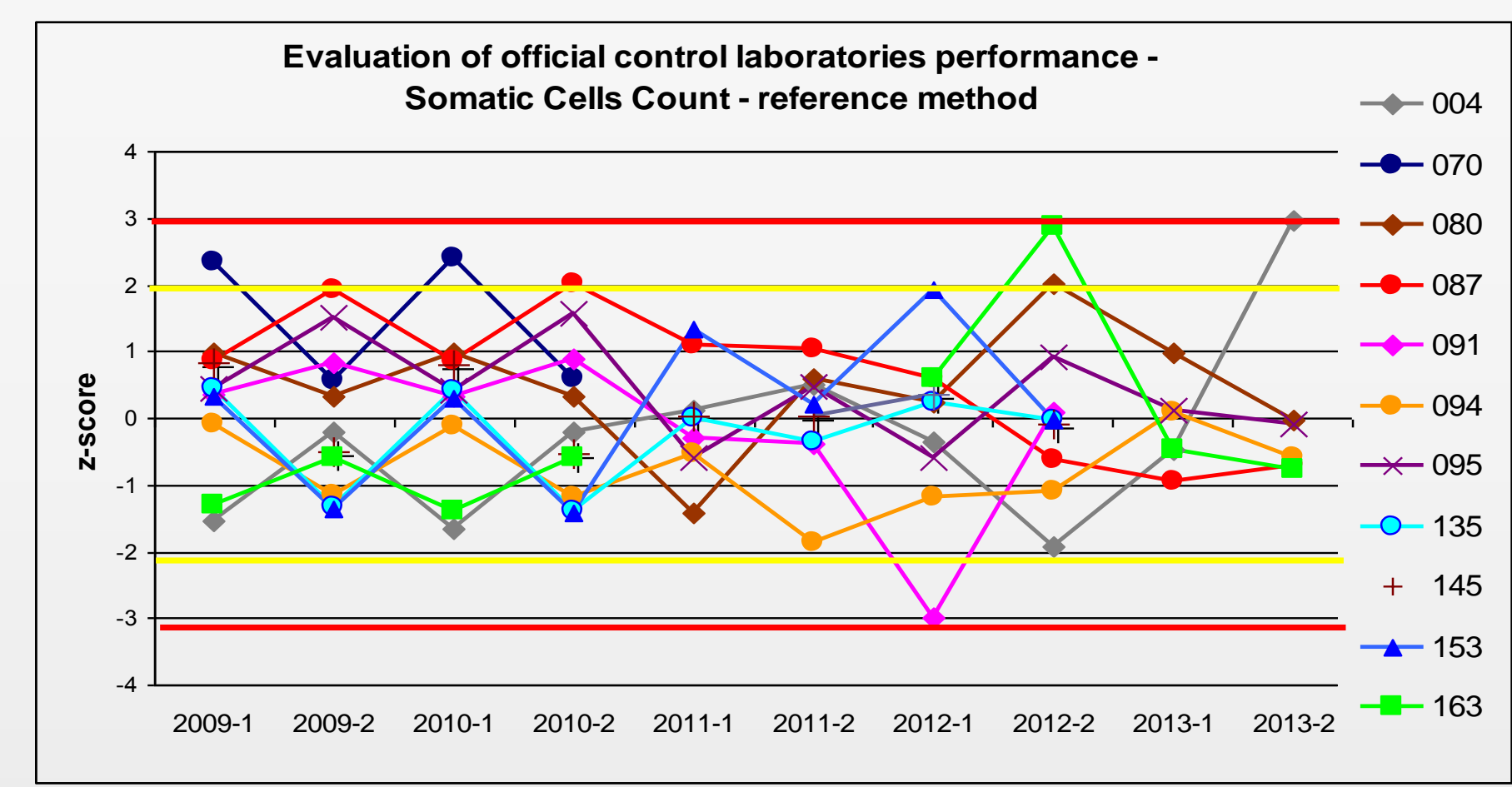
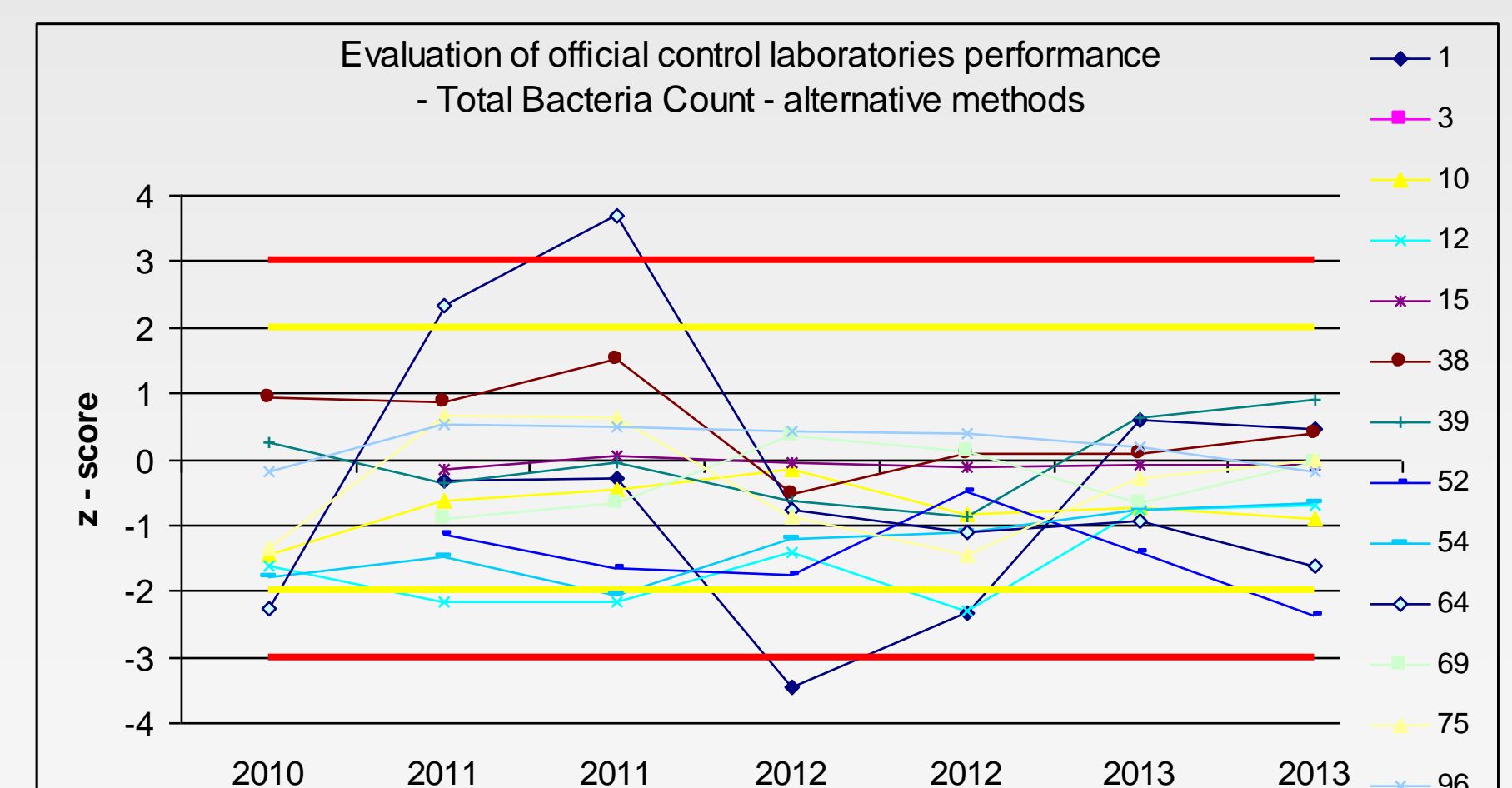
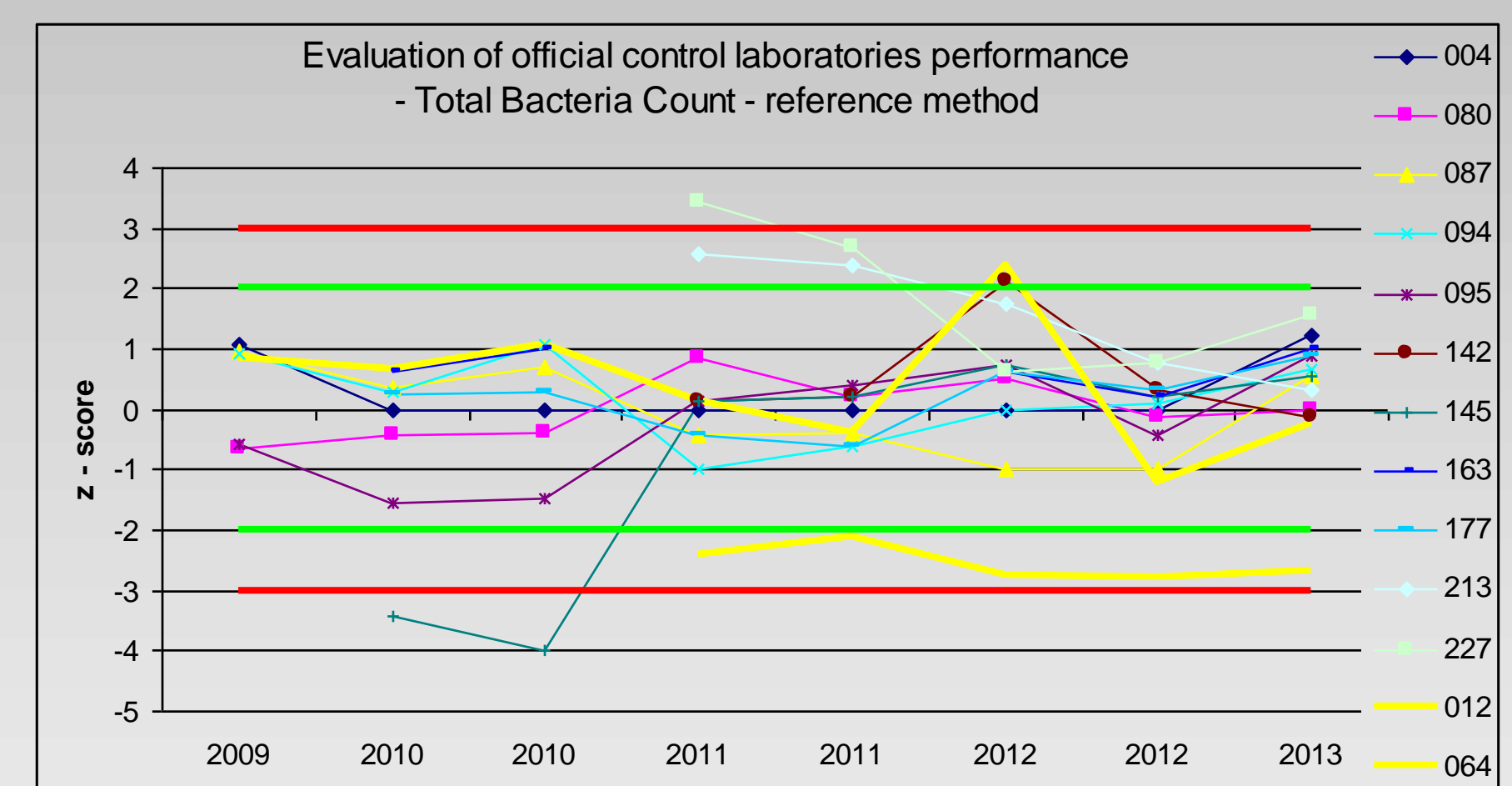
Lab assessment - z - score

$$z = \frac{x - X}{\sigma}$$

- x - lab result
- X - assigned value
- σ - standard deviation for proficiency assessment

Interpretation of z - score

z-score	Result
$ z \leq 2$	Satisfactory
$2 < z < 3$	Questionable
$ z \geq 3$	Unsatisfactory



During 2008 – 2012, twenty-three laboratories participated in proficiency testing for the enumeration of total bacteria. For somatic cells enumeration seventeen laboratories participated. These high numbers of satisfactory results obtained during PTs indicate good level of competence of laboratories performing official control of hygiene of raw milk.