Schweizerische Eidgenossenschaft
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Federal Department of Economic Affairs FDEA
Agroscope Liebefeld-Posieux Research Station ALP

Characterization of the ALP Somatic Cell Count Standard (SCCS) – a “Proficiency Testing”

T. Berger, C. Egger, S. Brunner

EU-RL MMP 2011 workshop, anses, Maisons-Alfort, 2. Mai 2011

ALP is part of the ALP-Haras Unit

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History of ALP Somatic Cell Count Standard (SCCS)

Beginnings

- approx. 1984 cooperation of ALP and VetSuisse faculty to produce a SCCS (Schällibaum, Limacher, Merminod)
- 1986 extraction of thymocytes and (because of BSE) later leucocytes from blood of young bulls by Bommeli corporation, preparation of ALP SCCS for Swiss raw milk control laboratories; reference value based only on ALP value
- approx. 1995 first customers in other countries
- 2002 more customers in other countries

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thomas.bereger@alp.admin.ch

History of ALP SCCS

Improvements

- 2004 reference value based on an international characterization
- 2004/2005 stability problems, transfer of the cell extraction to ALP, improvement of the procedure (Meyer, Bühlmann, Raemy, Brunner, Aebi)
- 2008 optimization of fixation procedure (Egger, Raemy, Brunner)

thomas.bereger@alp.admin.ch

History of ALP SCCS

Use of ALP SCCS

- Germany
- Netherlands
- Austria
- Switzerland
- Italy

- Chile

thomas.bereger@alp.admin.ch

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Use, quality, quantities and price

Use and quality

- ALP-SCCS is used for the evaluation of compara-bility, reproducibility and traceability of automated cell count measurements
- it covers the range from 150'000 to 450'000 cells/mL on two levels
- quality is checked at date of production and within the whole time of shelf life
  - homogeneity control during bottling
  - weekly check of reference values at ALP
  - evaluation of measurement results voluntary sent back by labs (evaluation report)

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Use, quality, quantities and price

Quantities and price

- volumes: 20, 27 and 40 mL in plastic tubes
- production 3x/year
- shelf life 6 months
- distribution frequency: monthly
- price: CHF -.45/mL incl. delivery

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Characterization of reference value

- based on DMSCC and ASCC measurements
- using a pool of experienced international laboratories:

- MCC-Vlaanderen, Lier (BE)
- BfEL/Max-Rubner-Inst, Kiel (DE)
- mpr-BW, Kirchheim (DE)
- mpr-BY, Wolnzach (DE)
- Greek Dairy Org., Ioannina (GR)
- ICBA, Caesaria (IL)
- AIA lsl, Roma (IT)
- LA-Santander, Santander (SP)
- LACM, Valdivia (CL)
- Qlip, Zutphen (NL)
- RIKILT, Wageningen (NL)
- mpr-OÖ, Ried (AT)
- University of Vienna/Vet. Dep. (AT)
- LNIV/ALIP, Lisboa/Lousada (PT)
- ALP, Liebefeld (CH)
- Suisselab AG, Zollikofen (CH)
- CMIO C.T.LAB, Nicosia (CY)
- SV Südtirol/FL Alto Adige, Bolzano (IT)

thomas.bereger@alp.admin.ch

Characterization of reference value

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Characterization of SCC reference material

Name of Laboratory:	LABORATORIO STANDARD LATTE		
Samples arrival date:	03.09.2008	**slope:**	
State of the samples at arrival:	GOOD	**intercept:**	
Date of launching of the analyses:	04.09.2008		

Automated measurement

Type of equipement: BENTLEY SOMACOUNT 150

Raw data	Sample low 1	Sample low 2	Sample low 3	Sample high 4	Sample high 5	Sample high 6		**low**	**high**
Measurement 1	232	234	219	507	505	518			
Measurement 2	219	229	221	507	520	516			
Measurement 3	229	223	230	498	517	511			
Measurement 4	229	218	225	501	496	511			
Measurement 5	220	225	225	495	510	508			
Mean value	**226**	**226**	**224**	**502**	**510**	**513**	Total mean	**225**	**508**
Standard deviation	6	6	4	5	10	4	Total standard deviation	5	8
Coefficient of variation %	2.6	2.7	1.9	1.1	1.9	0.8	Total CV %	2.3	1.6

Microscopic measurement

Raw data sample "high"	Operator 1: countings 1st	2nd	3rd	Operator 2: countings 1st	2nd	3rd		**high**
Film a	521							
Film b	520							
Mean value	**173**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Total mean	**521**

- procedure: the labs receive samples by normal post (stability has been checked) and an excel evaluation-sheet by email

thomas.bereger@alp.admin.ch

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Characterization of reference value

- results are returned by email within 14 days
- production and characterization are included in ISO 9001 certification and ISO 17025 accreditation
- no accreditation for PTs according to ISO 17043
- ISO 13528 is not explicitly followed

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thomas.bereger@alp.admin.ch

Characterization of reference value

AGROSCOPE·SCC-REFERENCE·MATERIAL·10C,·September·2010¶

2 → Statistical·data¶

2.1 → Routine·instruments,·all·data¶

¶

Results·and·group·means·in·SCC/µl¶

¶

Code¤	Count¤	L_1¤	L_2¤	L_3¤	L_mean¤	H_1¤	H_2¤	H_3¤	H_mean¤	¤
T_01_1¤	1¤	284¤	306¤	271¤	¤	557¤	578¤	610¤	¤	¤
T_01_1¤	2¤	281¤	294¤	278¤	¤	568¤	579¤	567¤	¤	¤
T_01_1¤	3¤	282¤	274¤	284¤	¤	581¤	577¤	555¤	¤	¤
T_01_1¤	4¤	292¤	289¤	267¤	¤	561¤	569¤	563¤	¤	¤
T_01_1¤	5¤	304¤	282¤	280¤	284.5¤	576¤	564¤	558¤	570.9¤	¤
T_01_2¤	1¤	313¤	295¤	294¤	¤	588¤	605¤	586¤	¤	¤

- statistical treatment of data includes following values [separately for Direct Microscopic SCC (DMSCC) and Automated SCC (ASCC)]:
  - outlier test, overall mean value, lab mean, standard deviation, coefficient of variation, z-score, repeatability, reproducibility, graphs
  - anonymised evaluation of labs

thomas.bereger@alp.admin.ch

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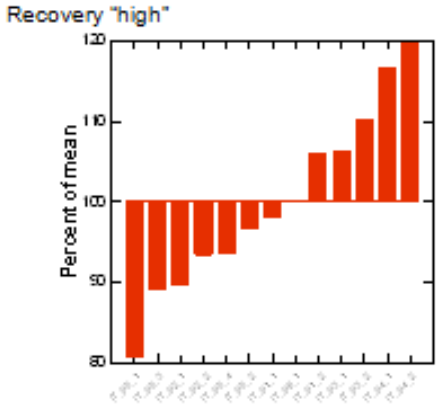
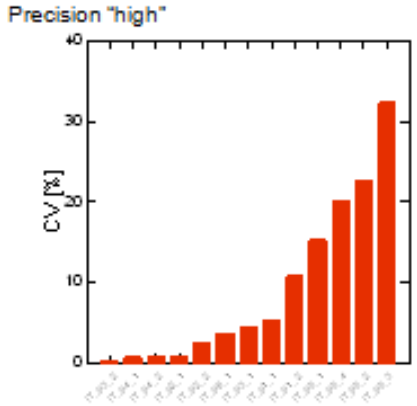
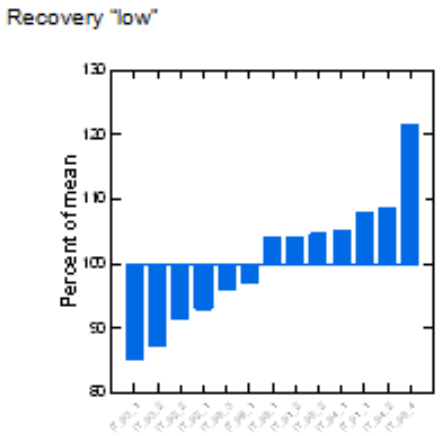
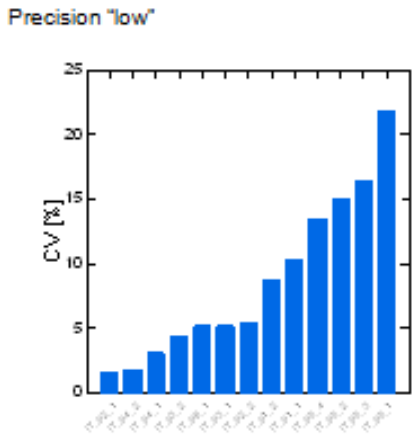
Characterization of reference value

- reference value is the mean value of the AFEMA laboratories → observed reproducibilities are usually better in equilibrated measurement networks









All routine instruments, deviation statistics

SCC/µl

LEVEL	LABS*	N	MEAN	S_L	S_r	S_R	RSD_L	RSD_r	RSD_R	r	R	R/r
SSC low	21	315	295.35	16.05	9.83	18.82	5.44	3.33	6.37	27.81	53.27	1.92
SSC high	21	315	594.17	19.46	14.10	24.04	3.28	2.37	4.05	39.91	68.02	1.70

*Laboratories or instruments, respectively. One instrument excluded for the estimation of the variance components of SSC high (Cochran outlier, p = 0.017)

thomas.bereger@alp.admin.ch

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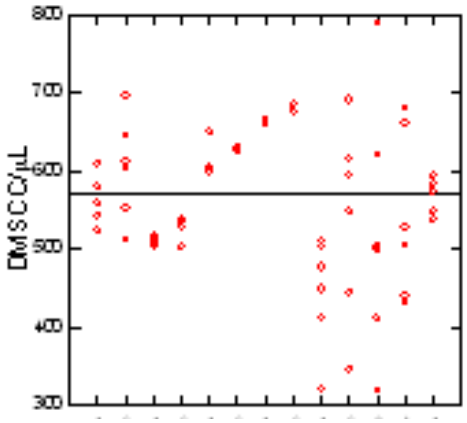
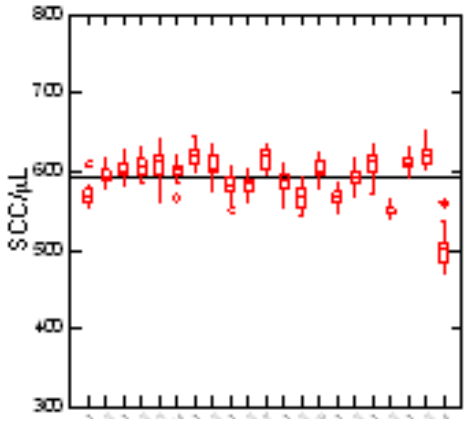
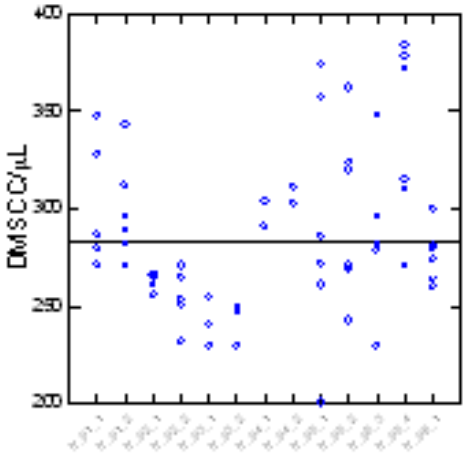
Characterization of reference value

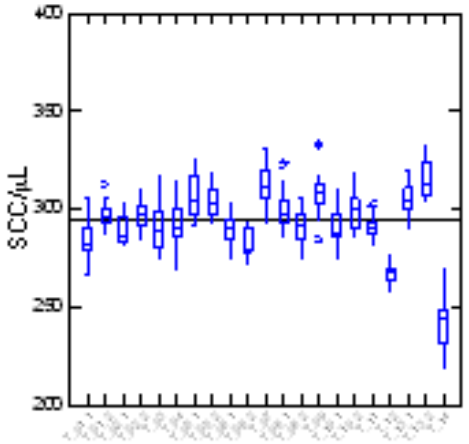
high





low





Reference

Routine

Agroscope SCC reference material September 2010

Reference method and routine method

no outliers removed

thomas.bereger@alp.admin.ch

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