A.I.S.E. Testing

Application of the A.I.S.E. minimum test protocol for detergent performance

Tom Hilgers, Nicole Maurenbrecher

wfk

The A.I.S.E. minimum test protocol for detergent performance is a set of principal requirements for testing, evaluation and communication of several aspects of laudry detergent performance

- **Stain/Soil removal**
- Color Maintenance
- Dye Transfer

Association Internationale de la Savonnerie, de la Détergence et des Produits d'Entretien
International Association for Soaps, Detergents and Maintenance Products

A.I.S.E. Working Group „Detergent Testing“

Test Protocol

– Principle based
– Includes **minimum** requirements – free to exceed those but not lower them
– Can be adapted to different countries/regions, differences in wash habits, wash temperatures, recommended dosages etc

Scope

– Logistics: communication, selection, pick-up, sampling
– Test execution
– Results: calculation, evaluation, communication

Categories

– HDD, LDD, Laundry Additives

Countries

- Should apply to all A.I.S.E. member countries

Benefits

- More realistic and more reliable comparison of product qualities for consumers
- Improvement in test quality
- Common approach

Working together for a cleaner Europe

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Working together for a cleaner Europe

Examples of European ConsumerReports

which?

Stiftung Warentest

test.de

ÖKO-TEST

RICHTIG GUT LEBEN

QUE CHOISIR

Consumentenbond

Dan weet je het.

TEST ACHATS

- The A.I.S.E. minimum test protocol is intended to allow realistic and reliable comparison of product qualities.

- The result is used e.g. for ranking or as a basis for grading products.

Let‘s look at an example ...

- We tested 6 HD market detergents (DE)
  (we actually tested one more, I'll explain why this is not mentioned here)

- 3 powders, 3 liquids

  - Wash temp. 40°C
  - Load 3,5 kg
  - Hardness 2,5 mmol/l

- Evaluation using A.I.S.E. evaluation tool ...

Microsoft Excel – AISE – Ecolabel Data Analysis.xls

Datei Bearbeiten Ansicht Einfügen Format Extras Daten Fenster ?

R19 =

Detection of single outlier (Dixon)

	Source	Products	Fabric/stain	Rep. external	Rep. internal
counts	1	7	19	5	1
# of data rows: 665	Lab X	A	Tea	1	1
		B	Coffee	2	
		C	Red wine	3	
# of data sets: 1		D	Fruit juice	4	
		E	Tomato puree	5	
		F	Carrot baby food		
		G	Mustard		
Data table is:			Chocolate		
Complete			Grass		
			Grass/mud		
# of data points: 665			Blood		
			Motor Oil		
			Frying fat		
Selected data: 1			Make-up		
			Milk		
			Salad dressing		
			Egg		
			Chocolate pudding		
			Cocoa		

Design new test

Fill table with data

Dixon test for outliers

Do you want replace outliers by the average?

(•) No ( ) Yes

Screen and select item

Data | Screen | Evaluation

Bereit

Microsoft Excel – AISE – Ecolabel Data Analysis.xls

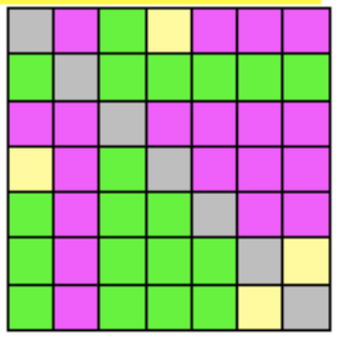
Datei Bearbeiten Ansicht Einfügen Format Extras Daten Fenster ?

A1

Update

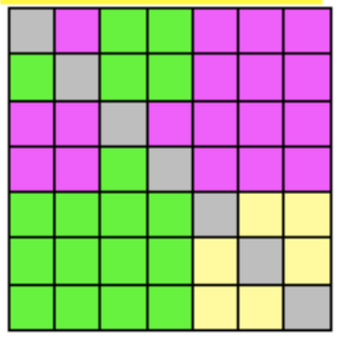
Select item

Tea



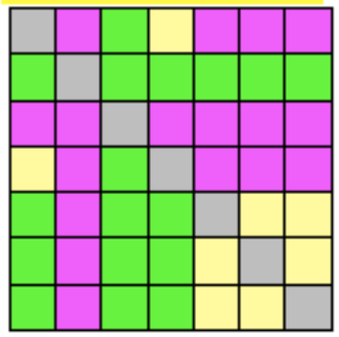
Significant counts: 38

Coffee



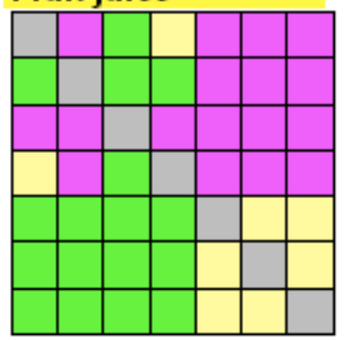
Significant counts: 36

Red wine



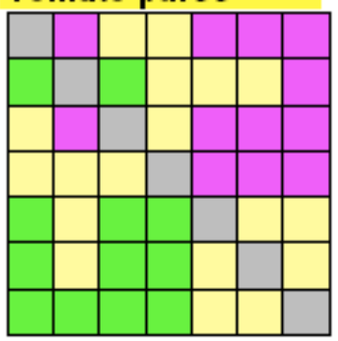
Significant counts: 34

Fruit juice



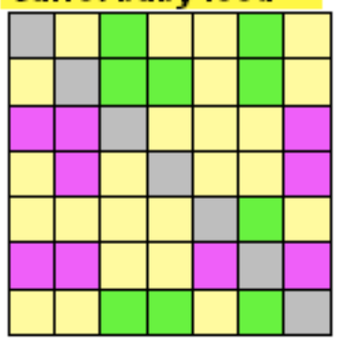
Significant counts: 34

Tomato puree



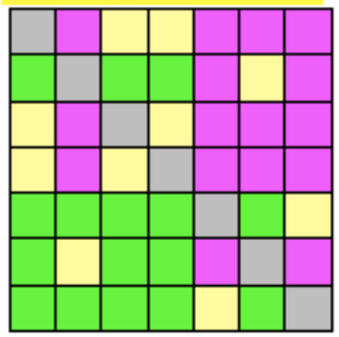
Significant counts: 24

Carrot baby food



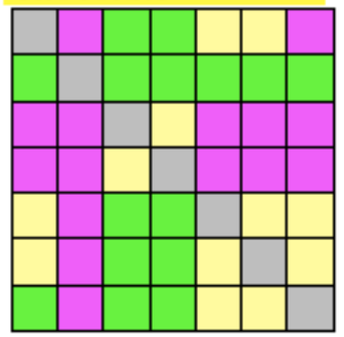
Significant counts: 18

Mustard



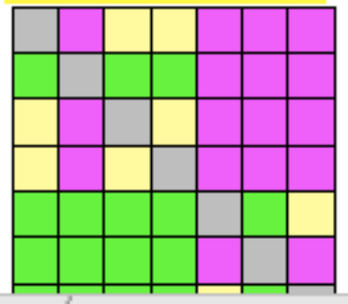
Significant counts: 32

Chocolate

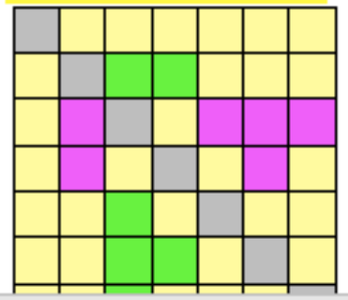


Significant counts: 30

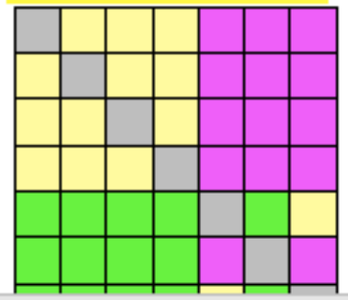
Grass



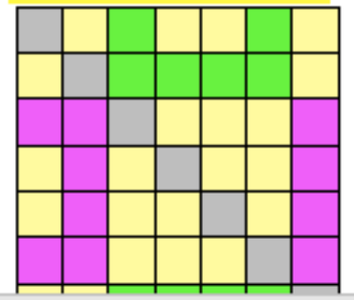
Grass/mud



Blood



Motor Oil



Data Screen Evaluation

Bereit

wfk

Microsoft Excel – AISE – Ecolabel Data Analysis.xls

Datei Bearbeiten Ansicht Einfügen Format Extras Daten Fenster ?

P4 = product

Select other items

Tea
Coffee
Red wine
Fruit juice
Tomato puree
Carrot baby food
Mustard
Chocolate
Grass
Grass/mud
Blood
Motor Oil
Frying fat
Make-up
Milk
Salad dressing
Egg
Chocolate pudding
Cocoa

Confidence level

- (•) 95%
- ( ) 99%

Table sorted by:

- (•) product
- ( ) data

product in column is significant better than product in row

product in row is significant better than product in column

no significant difference between products

Overall stain removal performance (Stain Removal %)

Mean difference of Stain Removal %

product	A	B	C	D	E	F	G
A		-6,47	2,55	1,18	-6,06	-4,56	-8,52
B	6,47		9,03	7,66	0,42	1,91	-2,05
C	-2,55	-9,03		-1,37	-8,61	-7,12	-11,07
D	-1,18	-7,66	1,37		-7,24	-5,75	-9,70
E	6,06	-0,42	8,61	7,24		1,49	-2,46
F	4,56	-1,91	7,12	5,75	-1,49		-3,96
G	8,52	2,05	11,07	9,70	2,46	3,96	

Average

product	Stain Removal %
A	69,56
B	63,08
C	72,11
D	70,74
E	63,50
F	64,99
G	61,04

Frequency of paired wins on Stain Removal %

Significant counts of Stain Removal % (+/not sig/-)

product	A	B	C	D	E	F	G
A		+0/8/-11	+11/8/-0	+4/14/-1	+0/10/-9	+2/8/-9	+0/5/-14
B	+11/8/-0		+16/3/-0	+15/4/-0	+7/6/-6	+8/7/-4	+4/6/-9
C	+0/8/-11	+0/3/-16		+0/14/-5	+0/5/-14	+0/5/-14	+0/1/-18
D	+1/14/-4	+0/4/-15	+5/14/-0		+1/5/-13	+1/6/-12	+0/2/-17
E	+9/10/-0	+6/6/-7	+14/5/-0	+13/5/-1		+6/12/-1	+0/14/-5
F	+9/8/-2	+4/7/-8	+14/5/-0	+12/6/-1	+1/12/-6		+0/9/-10
G	+14/5/-0	+9/6/-4	+18/1/-0	+17/2/-0	+5/14/-0	+10/9/-0	

Summary

product	+/-
A	27
B	-42
C	78
D	53
E	-34
F	-13
G	-69

Data Screen Evaluation

Bereit Summe=465,013921

Microsoft Excel – AISE – Ecolabel Data Analysis.xls

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C	+0/8/-11	+0/3/-16		+0/14/-5	+0/5/-14	+0/5/-14	+0/1/-18
D	+1/14/-4	+0/4/-15	+5/14/-0		+1/5/-13	+1/6/-12	+0/2/-17
E	+9/10/-0	+6/6/-7	+14/5/-0	+13/5/-1		+6/12/-1	+0/14/-5
F	+9/8/-2	+4/7/-8	+14/5/-0	+12/6/-1	+1/12/-6		+0/9/-10
G	+14/5/-0	+9/6/-4	+18/1/-0	+17/2/-0	+5/14/-0	+10/9/-0	

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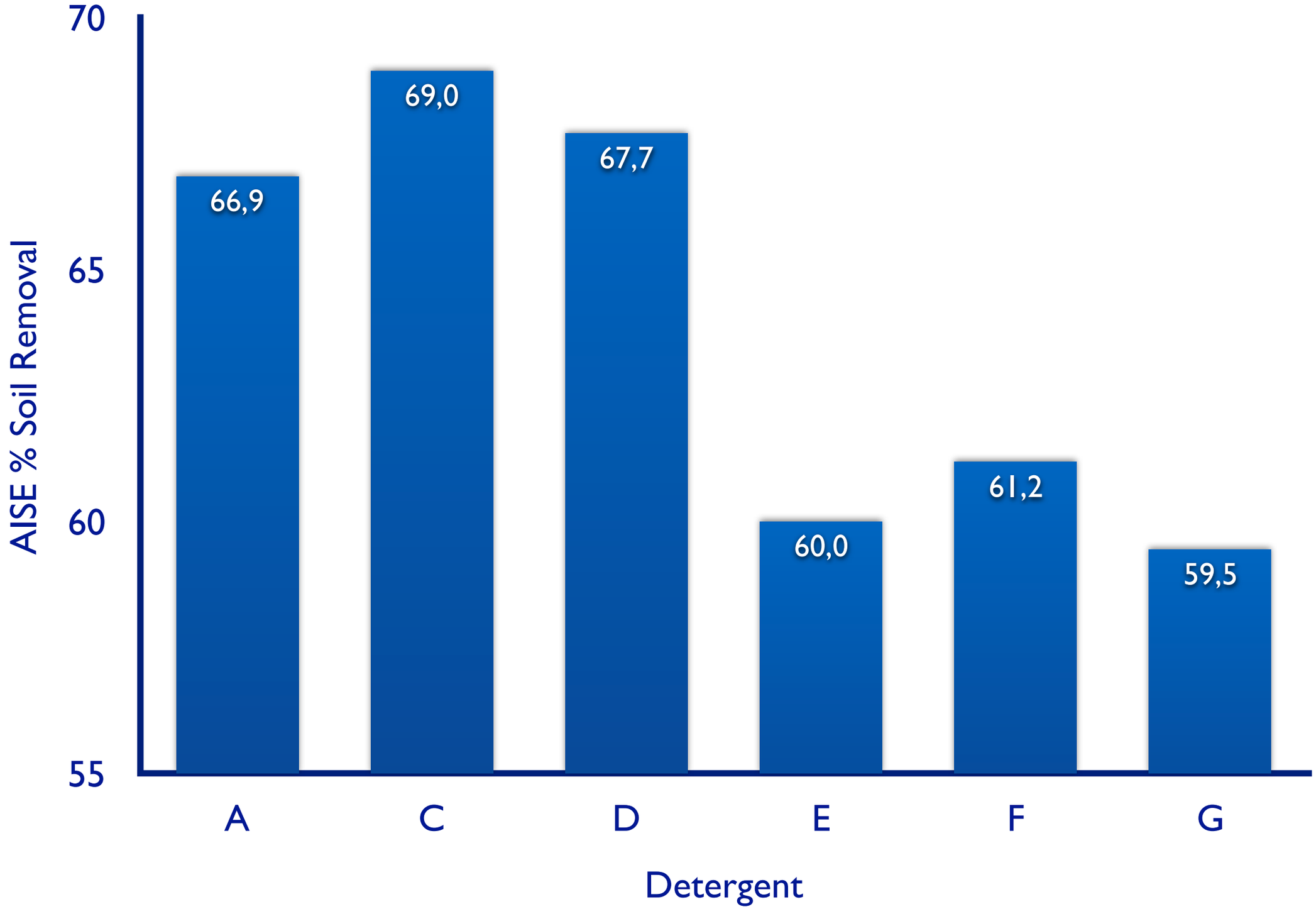
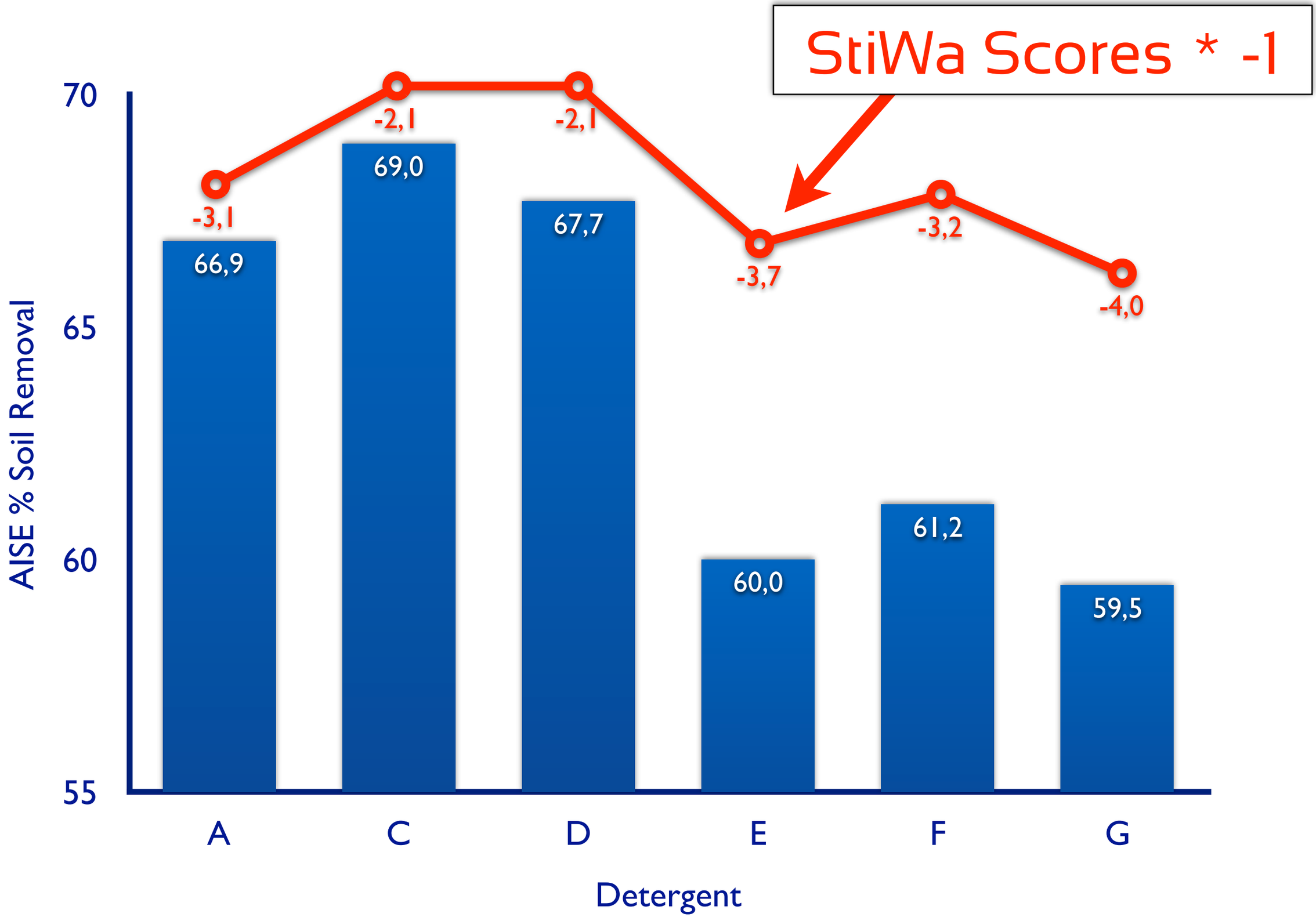
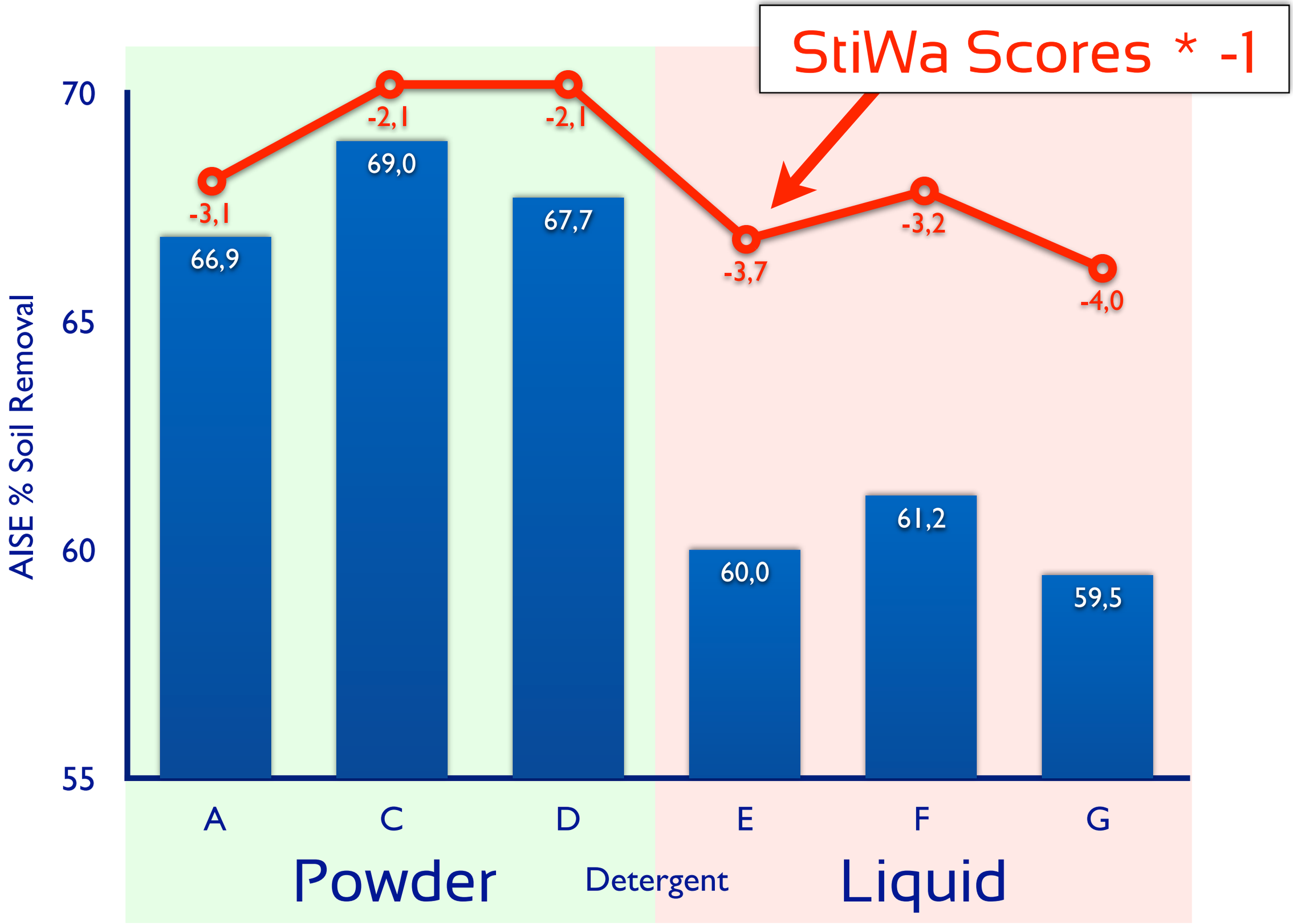






A·I·S·E

Association Internationale de la Savonnerie, de la Détergence et des Produits d'Entretien
International Association for Soaps, Detergents and Maintenance Products

NEW A.I.S.E. STAIN SET

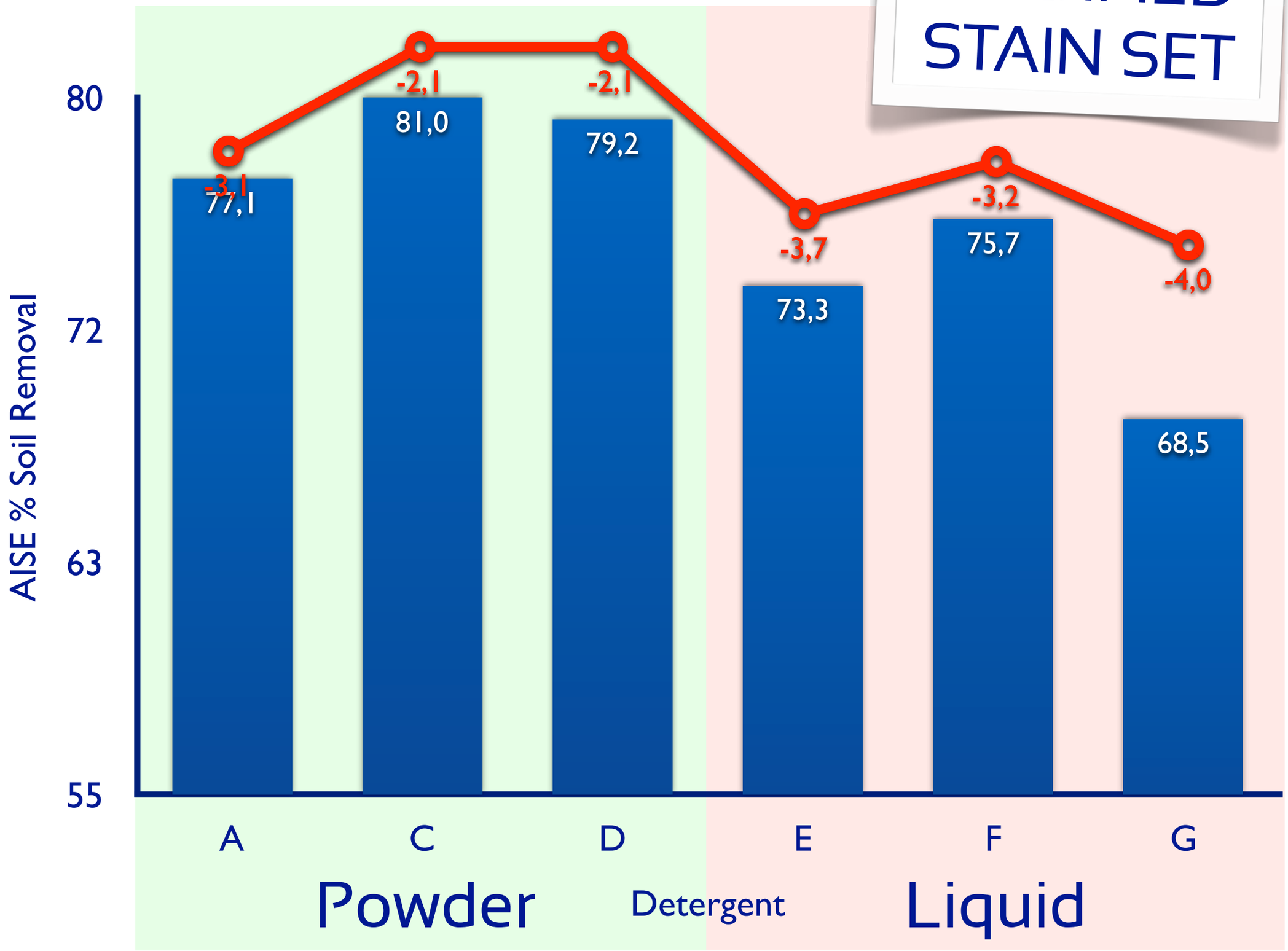
Stains	Standard Stains			Hand-made Stains* (ex Warwick-Equest)	Stain classes Consumer denomination/Chemical nature	
Tea	EMPA 167	WFK 10J	CFT BC3		Drink/	Bleachable
Coffee		WFK 10K	CFT BC2		Drink/	Bleachable
Red wine				WE5RWWKC	Drink/	Bleachable
Fruit juice			CFT CS15		Drink/	Bleachable
Tomato puree				WE5TPWKC	Food/	Bleachable
Carrot baby food				WE5IACBFWKC	Food/	Bleachable Enzymatic
French Squeezy Mustard				WE5FSMWKC	Food/	Bleachable Enzymatic
Chocolate		WFK 10Z	CFT CS44		Food/	Enzymatic
Grass	EMPA 164		CFT CS08		General soil/	Bleachable Enzymatic
Grass/Mud				WE5GMWKC	General soil/	Bleachable Enzymatic Particulate
Blood				WE5DASBWKC	General soil/	Enzymatic
Unused motor oil	EMPA 106	WFK 10 M	CFT C01		Grease, Oil/	Greasy Particulate
Frying fat (Hamburger grease)				WE5HBGBKC (blue knitted cotton)	Grease, Oil/	Greasy Enzymatic
Make up	EMPA 143/2	WFK 10MU	CFT CS17		Cosmetics/	Greasy Particulate

* All Hand-made Stains are also available in 2.5 cm diameter. Their code number has "2.5" instead of "5"

Working together for a cleaner Europe

Let‘s modify the stain set ...

MODIFIED STAIN SET



Remark: Based on this weproposed a revised ...

ECOLABEL STAIN SET

Stains	Standard Stains			Hand-made Stains* (ex Warwick-Equest)	Stain classes Consumer denomination / Chemical nature	
Tea	EMPA 167	WFK 10J	CFT BC3		Drink/	Bleachable
Coffee		WFK 10K	CFT BC2		Drink/	Bleachable
Red wine				WE5RWWKC	Drink/	Bleachable
Fruit juice			CFT CS15		Drink/	Bleachable
Tomato puree				WE5TPWKC	Food/	Bleachable
Carrot baby food				WE5IACBFWKC	Food/	Bleachable Enzymatic
French Squeezy Mustard				WE5FSMWKC	Food/	Bleachable Enzymatic
Chocolate		WFK 10Z	CFT CS44		Food/	Enzymatic
Grass	EMPA 164		CFT CS08		General soil/	Bleachable Enzymatic
Grass/Mud				WE5GMWKC	General soil/	Bleachable Enzymatic Particulate
Blood				WE5DASBWKC	General soil/	Enzymatic
Unused motor oil	EMPA 106	WFK 10 M	CFT C01		Grease, Oil/	Greasy Particulate
Frying fat (Hamburger grease)				WE5HBGBKC (blue knitted cotton)	Grease, Oil/	Greasy Enzymatic
Make up	EMPA 143/2	WFK 10MU	CFT CS17		Cosmetics/	Greasy Particulate
Milk (+ pigment)		WFK 10MR			Food/	Enzymatic
Salad dressing			CFT C06		Food/	Enzymatic
Egg (+ pigment)		WFK 10N			Food/	Enzymatic
Chocolate pudding	EMPA 165				Food/	Enzymatic
Cocoa		WFK 20MFU	CFT PC03		Food/	Bleachable Enzymatic Particulate

*All Hand-made Stains are also available in 2.5 cm diameter. Their code number has "2.5" instead of "5"

Conclusion ...

- The A.I.S.E. minimum test protocol is intended to allow realistic and reliable comparison of product qualities.

- The result is used e.g. for ranking or as a basis for grading products.

Consumer Org.

Stain removal

Color Maintenance

Dye Transfer

...

Consumer Org.

- Stain removal
  - Bleachable
  - Enzymatic
  - Greasy / Particulate
- Color Maintenance
- Dye Transfer
- ...

Consumer Org.

- Stain removal
  - Bleachable
  - Enzymatic
  - Greasy / Particulate
- Color Maintenance
- Dye Transfer
- ...

A·I·S·E

Conclusion

- Every test design and evaluation includes ‚weighing factors' for stain types.
- If the evaluation does not use explicit weighing factors, these factors are determined by the number of stains per group.

Conclusion

- A.I.S.E. test results could be more relevant if the dominating impact of the detergents‘ bleach activity would be reduced by
  - introduction of stain groups into the evaluation, and/or
  - revision of the stain set.

Thank you!