INTERNATIONAL STANDARD

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AMENDMENT 1
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Animal and vegetable fats and oils — Determination of unsaponifiable matter —

Part 2:
Rapid method using hexane extraction

AMENDMENT 1

Corps gras d'origines animale et végétale — Détermination de la teneur en matières insaponifiables —

Partie 2: Méthode rapide par extraction à l'hexane

AMENDEMENT 1

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Amendment 1 to International Standard ISO 3596-2:1988 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

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Add the following annex.

Annex A
(informative)

Results of interlaboratory tests

A.1 Participation

Fourteen laboratories from six different countries (France, Germany, Hungary, Malaysia, Netherlands, United Kingdom) took part in a collaborative study organized by the Institut Des Corps Gras Centre Technique Industriel.

A.2 Samples

Three samples were provided:

— Sample A: crude sunflower oil;

— Sample B: crude palm oil;

— Sample C: crude tallow.

A.3 Results

Tables A.1, A.2 and A.3 give the results obtained by the laboratories for the three samples A, B and C. Table A.4 gives the statistical results, sample by sample.

Two laboratories were eliminated for sample A on basis of the Cochran (Laboratory 6) and Dixon (Laboratory 9) tests, one for sample C on basis of the Dixon test (Laboratory 11) and none for sample B.

The mean values for the unsaponifiable matter content for the three samples were between 0,15 % and 0,58 % (*m*/*m*).

Repeatability limits are about 0,06 % (*m*/*m*) and repeatability coefficient of variation values are between 3,6 % and 10,5 %.

Reproducibility limits are about 0,18 % (*m*/*m*) and reproducibility coefficient of variation values are between 9 % and 36 %.

Table A.1 — Sample A: Crude sunflower oil

Laboratory	Result 1 % (*m*/*m*)	Result 2 % (*m*/*m*)
1	0,56	0,58
2	0,541	0,545
3	0,51	0,52
4	0,62	0,58
5	0,57	0,63
6	0,78	0,61
7	0,54	0,51
8	0,64	0,62
9	0,89	0,89
10	0,54	0,57
11	0,62	0,64
12	0,6	0,63
13	0,68	0,68
14	0,56	0,52
NOTE Laboratory 6 was eliminated on basis of the Cochran test (5 %). Laboratory 9 was eliminated on basis of the Dixon test (5 %).		

Table A.2 — Sample B: Crude palm oil

Laboratory	Result 1 % (*m*/*m*)	Result 2 % (*m*/*m*)
1	0,35	0,33
2	0,262 5	0,248 5
3	0,37	0,32
4	0,30	0,30
5	0,35	0,42
6	0,44	0,45
7	0,35	0,3
8	0,35	0,35
9	0,18	0,18
10	0,25	0,32
11	0,51	0,48
12	0,24	0,26
13	0,34	0,32
14	0,38	0,34

Table A.3 — Sample C: Crude tallow

Laboratory	Result 1 % (*m/m*)	Result 2 % (*m/m*)
1	0,16	0,18
2	0,133 7	0,106
3	0,18	0,17
4	0,15	0,14
5	0,22	0,23
6	0,09	0,12
7	0,09	0,11
8	0,2	0,21
9	0,04	0,03
10	0,13	0,18
11	0,40	0,41
12	0,13	0,14
13	0,23	0,22
14	0,16	0,19
NOTE Laboratory 11 was eliminated on the basis of the Dixon text (5 %).		

Table A.4 — Statistical analysis of collaborative study results

	Crude sunflower oil Sample A	Crude palm oil Sample B	Crude tallow Sample C
Number of laboratories	14	14	14
Number of laboratories retained after elimination of outliers	12	14	13
Mean, % (*m/m*)	0,58	0,33	0,15
Repeatability standard deviation, s_r, % (*m/m*)	0,02	0,03	0,02
Repeatability coefficient of variation (%)	3,64	7,81	10,49
Reproducibility standard deviation, s_R, % (*m/m*)	0,05	0,08	0,05
Reproducibility coefficient of variation (%)	8,99	24,63	36,32
Repeatability limit, r, % (*m/m*)	0,06	0,07	0,04
Reproducibility limit, R, % (*m/m*)	0,15	0,23	0,16