



Associazione
Italiana
Allevatori

(Ente Morale D.P.R. n.1051 del 27/10/1950)

COMITATO TECNICO CENTRALE CONTROLLI PRODUTTIVITÀ DEGLI OVINI E CAPRINI

*Si riportano nel presente Notiziario le delibere e le principali decisioni prese dal Comitato Tecnico Centrale per i controlli della produttività nei bovini da carne, nella riunione svoltasi il **6 3 2001***

NOTIZIARIO N.4

in questo numero:

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PREMESSA

1. Rinnovo componenti Comitato Tecnico Centrale

Dr. Angelo CIARDIELLO	Funzionario MiPAF
Dr.ssa Tiziana AMORINI	Funzionario MiPAF (vigilanza adempimenti)
Dr. Claudio MEGNA	Funzionario tecnico esperto Regione Sicilia
Dr. Sebastiano SANNA	Funzionario tecnico esperto Regione Sardegna
Dr.ssa Maria Lina SANDIONIGI	Funzionario tecnico esperto Regione Lombardia
(da designare)	Rappresentante Ministero della Sanita, Servizi Veterinari.
Sig. Fabio COIS	Rappresentante allevatori razze ovine
Sig. Rocco LIOY	Rappresentante allevatori razze ovine
Sig. Cesare MARZOLINI	Rappresentante allevatori razze ovine
Sig. Mario GUADUCCI	Rappresentante allevatori razze ovine
Sig. Gualberto MARTINI	Rappresentante allevatori razze caprine
Avv. Vincenzo FORMICA	Rappresentante allevatori razze caprine
Prof.. Antonio Mario PILLA	Esperto in zootecnia razze ovine, nomina MiPAF
Dr. Salvatore CASU	Esperto in zootecnia razze ovine, nomina MiPAF
Prof. Giuseppe ENNE	Esperto in zootecnia razze caprine, nomina MiPAF
Sig. Gavino PULINAS	Presidente Asso.Na.Pa.
Dr. Riccardo ALEANDRI	Rappresentante AIA
Dr. Corrado BRACCIAFERRI	Rappresentante AIA

2. Nomina Presidente e Vicepresidenti

All'unanimita' vengono eletti:

Presidente:

Sig. Gavino Pulinas (presidente Asso.Na.Pa)

Vicepresidenti:

Dr. Angelo Ciardiello (MiPAF)

Dr. Sebastiano Sanna (Regione Sardegna).

DELIBERE

1 Adeguamento codifica metodi di controllo.

Dopo attenta ed approfondita discussione il CTC all'unanimità delibera':

a) Entro il 31.12.2001 i metodi di controllo ufficiale nella specie ovina e caprina verranno riportati nei documenti ufficiali dei CCFF secondo la seguente codifica:

Esecutore controllo	cod	Mungiture Controllate nelle 24h	cod	Periodicità controllo	cod	cod	mungiture aziendali.	cod	campionatura	cod	animali soggetti al prelevamento del campione di latte	cod	stima della mungitura non controllata	cod
col.1		col.2		col.3			col.4		col.5		col.6		col.7	
controllore	A	tutte	A	ogni 4 settimane	4		una	1	su una mungitura	U	tutti	X	raddoppio	Y
allevatore	B	una alternata	T				due	2	su tutte le mungiture	P	solo primipare	S	con coefficienti di calcolo	F
		una non obbligatoriamente alternata	C				tre	3			nessuno	N	coefficienti ottenuti dal rapporto tra la mungitura controllata ed il latte presente nel tank	K
							robot	R					fornita da lattometro	J

b) Sul certificato di lattazione si adottano entro il 31.12.2001, le seguenti nuove codifiche e si da mandato agli uffici per adottare codifiche congrue rispetto al passato.

Gruppo	Codice	Descrizione
esecutore controllo	A	controllo eseguito dal controllore
	B	controllo eseguito dall'allevatore
mungiture controllate	A	il controllo e' fatto su tutte le mungiture
	T	il controllo e' fatto su una sola mungitura alternata
	C	il controllo e' fatto su una sola mungitura non alternata
periodicità	4	ogni 4 settimane
mungiture aziendali	1	la pecora/capra e' munta una volta al giorno
	2	la pecora/capra e' munta due volte al giorno
	3	la pecora/capra e' munta 3 volte al giorno
	R	la mungitura e' svolta dal robot
campionatura	U	il prelevamento del campione di latte e' fatto su una sola mungitura
	P	il prelevamento del campione di latte e' fatto su tutte le mungiture
stima della mungitura non controllata	Y	la/e mungitura/e mancante/i e'/sono stimata/e per raddoppio
	F	la/e mungitura/e mancante/i e'/sono calcolata/e
	K	la/le mungitura/e mancante/i e'/sono ottenuta/e mediante l'utilizzo di coefficienti ottenuti dal rapporto tra la mungitura controllata ed il latte presente nel tank considerando il latte contenuto nel tank
	J	la/le mungitura/e mancante/i e'/sono fornita/e dal lattometro elettronico
segnalazioni	W	la lattazione e' inferiore al limite previsto per razza
	D	la lattazione e' dubbia in seguito a visita ispettiva
	I	intercontrolli irregolari/non raggiunto numero minimo di controlli
	H	irregolare per periodo parto-1° controllo

c) Le nuove codifiche descritte ai punti a) e b) saranno applicate nella nuova procedura standard dell'AIA (Procedura Unica Multispecie degli Allevatori = PUMA).

2. Analisi grasso e proteine per singolo capo.

Il CTC dopo attenta ed approfondita discussione, tenendo conto di quanto deliberato in merito dal Comitato della Razza Sarda all'unanimità delibera:

conferma l'utilità al campionamento per singolo capo su tutti i soggetti ovis e caprini, su base volontaria; rende obbligatorio il prelevamento del campione di latte per singolo capo:

- per tutti i soggetti di razza Sarda primipari, per almeno 2 controlli consecutivi nella stessa lattazione (operativamente cioè significa che gli Uffici Provinciali debbono organizzare i calendari dei controlli prevedendo nel periodo dei parti delle primipare almeno 3 visite in azienda con prelevamento del campione);
- per tutti i soggetti caprini delle razze Saanen e Camosciata.

La presente delibera si applica a far data dal 1° settembre 2001.

3.ECM, CP proposta di modifica calcolo lattazioni convenzionali per nuovi certificati di lattazione.

Il CTC dopo attenta ed approfondita discussione all'unanimità delibera:

- a) **e' approvata la metodologia ed i coefficienti realizzati dall'A.I.A. ai fini della formulazione dell'E.C.M. (Equivalente Capra Matura) e C.P. (Capacità Produttiva) per le capre di razza Saanen, Canosciata delle Alpi, Sarda, Maltese, Jonica, Derivata di Siria, nonché per le altre razze alle stesse assimilate, come risulta dal prospetto allegato.**
- b) **e' approvata la metodologia ed i coefficienti realizzati dall'A.I.A. ai fini della formulazione della Previsione di Lattazione alla durata di riferimento per le capre di razza Saanen, Canosciata delle Alpi, Sarda, Maltese, Jonica, Derivata di Siria, nonché per le altre razze alle stesse assimilate, come risulta dal prospetto allegato**
- c) **e' approvata la metodologia ed i coefficienti realizzati dall'A.I.A. ai fini della formulazione della Previsione di Lattazione alla durata di riferimento per ovini di razza Moscia Leccese, Sarda, Massese, Barbaresca, Comisana, Delle Langhe, Pinzirita, Valle del Belice, nonché per le altre razze alle stesse assimilate, come risulta dal prospetto allegato.**
- d) **e' approvato il nuovo modello di certificato di lattazione che omogenizza le informazioni riportate per ovini, caprini, bovini e bufalini, sul quale saranno esposte le Proiezioni di Lattazione stimate con i metodi di cui ai punti b) e c) della presente delibera.**
- e) **e' recepita la norma ICAR che prevede per il calcolo delle lattazioni reali e convenzionali nei caprini il rispetto dei seguenti parametri:**
 - **i controlli funzionali dovranno avere inizio non prima del 10° giorno successivo al parto;**
 - **per il calcolo della lattazione reale verranno utilizzati tutti i controlli effettuati dal 10° giorno dal parto;**
 - **per il calcolo della lattazione convenzionale saranno utilizzati esclusivamente i controlli effettuati a partire da 41° giorno dal parto.**

La presente delibera si applica entro il 31/12/2001

4.Strumenti di misurazione delle produzioni approvati dall'ICAR.

Il CTC dopo attenta ed approfondita discussione all'unanimità delibera:

- a) sono ritenute valide ai fini dei controlli funzionali nelle specie ovina e caprina le produzioni rilevate per mezzo delle seguenti strumentazioni:

categoria	modello
VASI MISURATORI	Vaso misuratore manuale MIBO
VASI MISURATORI PER MACCHINE MUNGITRICI	Vaso MIBO Vaso ALFA-LAVAL Vaso ROYAL Vaso WESTFALIA SEPARATOR Vaso MISURATORE ITALIANA
LATTOMETRI - PRELEVATORI PER IMPIANTI DI MUNGITURA	Lattometro TRU TEST mod. H.I. (n. 505011)

- b) ulteriori modelli di strumenti misuratori utilizzabili ai fini dei controlli funzionali, nelle specie ovina e caprina, dovranno risultare preventivamente approvati dall'ICAR.

La presente delibera si applica con decorrenza immediata.

ALLEGATI

A. Tabelle di corrispondenza per il calcolo di PRV e EPM/ECM in OVINI e CAPRINI

OVINI (razza)	Codice	Attitudine Produttiva (L= latte; C= carne)	PRV	EPM
Moscia Leccese	20	L	suo	suo
Sarda	21	L	suo	suo
Massese	22	L	suo	suo
Barbaresca	23	L	suo	suo
Comisana	24	L	suo	suo
Altamurana	25	L	20	20
Appenninica	26	C		
Gentile Di Puglia	27	C		
Laticauda	28	C		
Sopravissana	29	D	30	30
Langhe	30	L	suo	suo
Merinizzata	31	C		
Bergamasca	32	C		
Pinzirita	33	L	suo	suo
Brigasca	34	D	30	30
Fasanese	35			
Frisona Italiana	36	L	30	30
Finnica	37	D	30	30
Cornella Bianca	38	L	24	24
Fabrianese	39	C		
Biellese	71	C		
Corniglio (Bologna)	72	L	30	30
Ile De France	73	C		
Suffolk	74	C		
Romanov	75	D	30	30
Valle Belice	76	L	suo	suo
Bagnolese	79	L	30	30
Zerasca	97			
Carsolina	98	D	30	30
Frabosana	F0	D	30	30
Alpagota	F1	D	30	30
Bellunese	F2	D	30	30
Brentegana	F3	C		
Brogne	F5	C		

Ciavenasca	F6	C		
Di Benevento (Quadrella)	F7	C		
Pecora di Corteno	F8	C		
Finarda	F9	C		
Saltasassi	G0	C		
Garessina	G1	D	30	30
Garfagnina Bianca	G2	L	22	22
Lamon (Lamonese)	G3	D	30	30
Nostrana	G4	C		
Marrane	G5	C		
Matesina	G6	C		
Pomarancina	G7	D	30	30
Pusterese	G8	C		
Rosset	G9	C		
Lacaune	R0	L	21	21
Sambucana (Demontina)	R1	C		
Sampeierina	R2			
Savoiarda	R3	D	30	30
Sciara (Moscia Calabrese)	R4	L	20	20
Tacola	R5	C		
Varesina	R6	C		
Vissana	R7	D	30	30
Berichonne Du Cher	R9	C		
Trimeticcia di Segezia	TR	D	30	30
Turchessa	TU			
Mefficcia Ovini	VV		30	30

CAPRINI (razza)	Codice	Attitudine Produttiva (L= latte; C= carne)	PRV	ECM
Maltese	40	L	suo	suo
Garganica	41	L	40	40
Girgentana	42	L	48	48
Bionda Amadello	43	L	45	45
Saanen	44	L	suo	suo
Camosciata Delle Alpi	45	L	suo	suo
Frisa Valtellinese	46	L	44	44
Sarda	47	L	suo	suo
Derivata Di Siria	48	L	suo	suo
Toggenburg	49	L	45	45
Argentata Dell'etna	89	L	48	48
Jonica	90	L	suo	suo
Campobasso (Grigia Molisana)	91	L	40	40
Vallese	92	L	45	45
Verzaschese	93	L	45	45
Orobica	94	L	45	45
Roccamerano	95	L	44	44
Meticcia Caprini	CP	L	47	47
Di Teramo	L0	L	40	40
Alpina	L1	L	45	45
Cilentana Fulva	L3	L	40	40
Cilentana Grigia	L4	L	40	40
Cilentana Nera	L5	L	40	40
Ciocciara Grigia	L6	L	40	40
Di L'Aquila	L7	L	45	45
Di Montecristo	L8	L	47	47
Grigia di Lucania (Potenza)	L9	L	40	40
Napoletana	M0	L	40	40
Fulva degli Alburni	M2	L	48	48
Fulva dei monti Piacentini	M3	L	48	48
Fulva Lucana	M4	L	48	48
Garfagnana	M5	L	45	45
Grigia degli Alburni	M6	L	40	40
Grigia dei monti Piacentini	M7	L	40	40
Istriana	M8	L	44	44
Mantellata Posteriore	M9	L	40	40
Pomellata	N1	L	47	47
Sarda Primitiva	N2	L	47	47
Sciara (Rustica calabrese di Cosenza)	N3	L	40	40

Screziata	N4	L	40	40
Selvaggia	N5	L	40	40
Sempione	N6	L	44	44
Valfortorina (di Benevento)	N7	L	40	40
Valgerola	N8	L	45	45
Passerir Gebirgziege	N9			

B. Procedure ICAR per l'omologazione degli strumenti di misurazione delle produzioni negli ovini e caprini da latte.

(SECTION 11 PART 7.3)

TESTS FOR PROVISIONAL APPROVAL FOR MILK METERS FOR SHEEP AND GOATS

The manufacturer shall provide 30 meters out of which 2 meters randomly selected shall be used for laboratory test and 4 meters and a reserve meter randomly selected to be used for farm tests. For fixed in-place meters the 4 meters and the reserve meter can be selected from meters already installed on at least 2 farms and already calibrated on these farms.

7.3.1 Conformity

For the provisional approval of new models the milk recording equipment shall be checked for conformity with the requirements specified in the Parts 4 and 5 and will be subjected to the following procedures:

7.3.2 Laboratory Tests

The meter will be examined in the laboratory for the criteria listed in sections 7.3.2.1 – 7.3.2.2.6. Where meters appear to be unsatisfactory under simulated or laboratory conditions, this fact should be noted in the report and should be taken into consideration in the overall evaluation.

Laboratory tests related to different flow rates shall be made with milk and all other tests shall be made with water.

The manufacturer shall state if any special conditions must be fulfilled such as the temperature of the water or chemicals needed to increase the electrical conductivity.

Where special test solutions are needed, the chemicals and concentrations shall be as recommended by the manufacturer of the meter.

Where water is used it may be necessary to correct measurements with water to allow for difference to milk.

In this case it will be assumed that "normal" milk density is 1.032 kg/l for goats and 1.036 kg/l for sheep that water weights should be corrected where necessary by 3% (3,6% for sheep). When the manufacturer specifies a correction factor, this factor is used.

The test rig shall consist of a vacuum system operating at the vacuum level recommended by the manufacturer of the meter or, in the absence of any recommendation, at 45 kPa if the meter is intended for high line installations and 38 kPa if intended for low line. It shall comply in all appropriate respects with the requirements of ISO 5707 (and special quantitative requirements for small ruminants in preparation), especially with regard to vacuum stability and air admission/leakage. Testing equipment used shall comply with the accuracy requirements of ISO 6690 and weight measuring instruments shall have a maximum error of 0.004 kg.

Tests related to milk flow rates shall be made at a vacuum level 38kPa and with air bleed at the cluster of 8 l/min. The same statistical analysis is used as is used for the farm test.

7.3.2.1 Accuracy of measurement at various liquid flow rates

The milk meter is tested at constant liquid flow rates from 0,3 kg/min to up to 3.0 kg/min, using a suitable milking unit (artificial udder). It is recommended that at least five approximate flow rates are covered – 0,3, 0,6, 1.0, 1,5 and 3.0 kg/min.

The liquid should pass through the meter during 4 minutes when tested the following flow rates: 0,3 and 06 kg/min. and 2 minute when tested 1, 1,5 and 3 kg/min and in each case the actual flow rate is measured.

At least two repetitions at each flow rate are made to contribute towards a total of at least 20 readings.

The weight of liquid displayed by the meter is noted in each case and the differences between meter and reference are plotted graphically against flow rate. Any significant deviations at specific flow rates should be noted on the final report.

The requirement is that a milk meter has to work within the limits of error up to a flowrate of 4 kg/min and that between a flowrate of 3-4 kg/min a larger deviation is acceptable but the meter still has to operate.

No test at various flow rates will be made with jars.

7.3.2.2 Mechanical

These are intended to test meter behaviour under variations in certain operating parameters, to obtain information on the operating limits of the model under consideration. In particular, they are intended to determine whether possible variations of such parameters have an effect on meter precision and whether the connection of the instrument to the milking machine results in any loss of milking performance.

7.3.2.2.1 Accuracy of measurement at various vacuum levels

One milk meter shall be used to repeat the procedure in 7.3.2.1 at vacuum levels of 30, 38, and 45 kPa.

With jars, tests with various levels shall be made only at 45 kPa.

A tolerance in the vacuum level of ± 0.5 kPa is acceptable.

Tests at various vacuum levels shall be made with an air admission at the cluster of 8 l/min, and at a liquid flow rate of 3 l/min.

Tests with jars will be made at only 45 kPa.

In each case two measurements will be made at each vacuum level.

7.3.2.2.2 Teat end vacuum

7.3.2.2.2.1 Milk meters

The test shall be made by comparing the vacuum in the cluster with and without the milk

meter according to ISO 6690.

Measurements at the teat end (or at the claw) will be made at a vacuum level of 38 kPa and with an air admission at the cluster of 8 l/min. and at a liquid flow rate of 3 l/min..

Two measurements will be made during the period of 15 seconds, then the average claw vacuum will be calculated in both conditions and compared.

If the manufacturer specifies a particular type of cluster assembly, long milk tube, milk elevation or pulsation for use with his milk meter, then that type shall be used.

In the absence of such specifications, and when the milk meter is intended for use with several types of milking units and heights of milk elevation, the reference unit described in Appendix 1 shall be used.

If the manufacturer intends the meter to be used at different heights with respect to the milking pipeline, then several measurements (at the same flow rate of approximately 3 kg/min) shall be taken to confirm that the meter complies with the requirements in all positions.

7.3.2.2.2 Recorder jars

The test shall be made according to ISO 6690 using the actual parts of the reference unit as described in Appendix 1.

7.3.2.2.3 Accuracy of measurement at various airflow rates

The air admission shall be measured with 38 kPa vacuum in the unit. A tolerance of ± 0.5 kg/min per level of flow rate can be accepted.

The procedure shall be used at a flow rate of 3 kg/min with the following air admission rates: 0, 8 and 15 l/min.

Two measurements will be made at each air admission only with milk meters.

7.3.2.2.4 Accuracy of measurement with the meter tilted

The procedure shall be used at a flow rate of 3 kg/min and at 38 kPa vacuum level with the meter inclined at an angle as stated in the manufacturer's instructions for the mounting of the meter.

In the absence of any specifications, the Test Center shall investigate the more sensitive plan with the meter tilted that influences accuracy of the milk meter and measurement shall be made only in this plan at an angle of 5° and 10°.

These tests will be also made with jars.

Two measurements will be made at each angle.

For portable meters, measurements should be taken to establish at what point the angle of tilt adversely affects the overall meter accuracy.

7.3.2.2.5 Assessment of the ease of carrying out routine accuracy checks

It shall be assessed whether the correct functioning of the milk meter can be easily checked by means of a simple routine test (preferably to be conducted outside of milking hours using water). The test center shall investigate and recommend an appropriate test in the report of the approval test of the meter.

7.3.2.2.6 Collection of sufficient milk for sampling

During the course of laboratory tests the proportion of milk collected by the jar and meter shall be checked for compliance with the minimum requirement of 20ml at 0,3 kg (or 0,3 l) of milk at the stated vacuum level (38 kPa) and air admission at the cluster (8 l/min.).

7.3.2.2.7 Effects on free fatty acids

The tests on influence of the studied milk meter or jar on FFA are optional.

7.3.3 Farm Test

The factors which have major effects on metering accuracy of this type of instrument are milking machine characteristics and milk flow rate. The farm test should be carried out so that these factors are taken into consideration.

This test is carried out under normal milking conditions on farms milking two times per 24 hours, in order to determine whether, under actual operating conditions, the instrument meets the accuracy requirements specified under Section 6.3 and 6.4 for milk yield measurement and sample collection within the stated margins of error.

Testing equipment used shall comply with the accuracy requirements of ISO 6690 and weight measuring instruments shall have a maximum error of 0.004 for sheep and goats.

7.3.3.1 The following requirements must be met

- 1. The meter itself shall be tested.**
- 2. The milking machine effect - the meters shall be tested on one farm - four meters at one farms.**

When testing transportable meters, it is preferable to choose a farm with a pipeline milking system.

The milking machine on which the meters are to be tested shall be checked and found to comply with ISO 5707 before any meters are tested.

- 3. Milk flow rate, yield and butterfat content - these will vary between animals and from morning to evening milking. The meters must therefore be tested at both morning and evening milkings.**
- 4. The meters shall also be tested over as wide a range of yields as possible.**

For goats it is recommended that a minimum of 25% of the observations should be less than 0,8 kg and minimum of 25% of the observations should be above 2,5 kg/milking.

For sheep it is recommended that a minimum of 25% of the observations should be less than 0,5 kg and minimum of 25% of the observations should be above 1,2 kg/milking.

5. During the test the meters shall be connected to the milking equipment according to the manufacturers instructions with provision being made to trap the whole of each individual animal's milk after it has passed through the meter (for example see diagram 1). This milk so trapped is used as a reference against which to compare the meter results for both weight of milk and butterfat content.

6. For butterfat content analysis, samples shall be taken from both the reference milk and that collected by the meter.

Duplicate samples shall be taken both from the milk collected in the meter and from the reference milk, by taking two separate dips of the whole milk. Comparison of these samples with their duplicates shall be used to calculate errors introduced by sampling and analysis techniques.

7. At least 30 reliable data for milk yield and 25 data for fat content shall be undertaken for each meter under test, with the milkings distributed equally between morning and evening milkings. The figures for fat content should be within the range of 2 – 12 % for milk for both sheep and goats.

8. Permanently installed meters shall be used regularly on the farm for a period of no less than 2 months or 2.000 milkings, whichever occurs first, after finishing the first farm test. At the conclusion of this period the 4 meters are then re-tested and then re-calibrated .When a meter is damaged this is reported directly to the test-institute and the test-institute decides what to do in consultation with the manufacturer.

7.3.3.2 Cleaning and disinfecting

If performed at the farm, periodic checks of the effectiveness of cleaning and disinfecting of the meters shall be carried out monthly on at least 2 farms during the period of regular use (ref. 7.1.3.1.8). The test shall comprise a visual inspection and objective measurement with ATP method.

The visual inspection shall be done immediately after cleaning in place. All meters of the farm shall be subjected to detect any presence of residues.

With the ATP method, swabs will be made on each place where cleaning and disinfecting could be ineffective (or less effective than expected), especially on the top of the meter in the different chambers and in the samplers.

At least 4 or 5 swabs should be taken for 4 milk meters randomly chosen on the farm and one at the top of each claw of each milking unit where the meters are assembled.

The milk meter has passed the test if:

- there are no visible residues on milk contact surfaces, and
- results of ATP method for meters are located within the range where the tested surfaces are assessed to be clean surfaces;
- results of ATP method for the tested meters are at least equal or better than those recorded in the claw at the same unit.

If either visual inspection or results of ATP show that cleaning of the meter is ineffective, the adequate measures for improvement shall be undertaken and the tests repeated.

7.3.3.3 Recording Accuracy Test

In appendix 3 the statistical treatment of the results is given.

All 4 meters shall comply with the accuracy requirements of paragraphs 5.3 and 5.4 at all farm tests.

Only instruments which successfully passed the farm tests shall be accepted for use in official milk recording.

(In cases where only one meter from the 4 selected by the Test Center appears to be faulty due to poor calibration, or chance, then the Test Center may, at its discretion, retest that meter only. If that meter is shown to be satisfactory at the retest, the Test Center may then recommend approval of the meter for use in official milk recording).

7.3.3.4 Handling and Operational Tests

These are subjective tests and are not, therefore, specified but the intention is to test the ease of handling under actual operating conditions. Where the meter is designed to be portable the tests are particularly intended to check ease of transport of the meter and of its attachment to and removal from the milking equipment and washing plant. In the course of these tests an evaluation is also made of the meter's sturdiness under actual operating conditions, and of any other characteristics relevant to its practical usefulness.

This test is to be carried out on the same four meters during the entire test period.