
Guidelines for simplified buffalo milk recording for low to medium input production systems

Buffalo milk recording activity in a country, region or district should be developed and supervised by a single organization, through its national, regional and/or local structures. The organization could be a public or private institution such as a research institute, farmers' cooperative, NGO or even a private company. To be sustainable it needs the official recognition of the concerned government ministry and the promotion and support of the stakeholders benefiting from milk recording.

Responsible organisation

To become internationally recognised the country and the milk recording organization needs to seek the membership of ICAR.

The farmer wanting to participate in milk recording must:

- accept the regulations of the recording organization;
- register his buffaloes under the animal identification system provided by the recording organization; and
- milk record all buffaloes of the herd.

Farmer's duties

Note: A herd could also refer to a group of herds in a village in cases where the individual herds are composed of a very small number of animals.

The milk recording activity is performed by trained technicians who have the following tasks:

- provide the farmer with the identification of all newborn calves;
- visit the herds according to the calendar established by the recording activity;
- register inseminations, matings, calving, deaths and dates of drying-off;
- weigh the milk produced by each individual buffalo at the two daily milkings (use the measuring devices approved by ICAR if they exist): milk must be weighed on a scale with sensitivity of at least 250 g or volumetrically measured with calibrated measures with sensitivity of 250 cc; and

Control technicians

- register milk production on the forms established by the recording organization.

Milk recording

1. Milk recording has to be carried out throughout the whole lactation.
2. Milk recording has to be carried out on all the buffaloes in the herd.
3. The first milk recording cannot be performed before the evening of the 5th day after calving.
4. The first milk recording must be performed within the 75th day after calving.
5. The minimum interval between two tests should be 25 days.
6. The maximum interval between two tests should be 46 days.
7. Due to proved and justified reasons, only one longer interval in one lactation can be accepted, provided that the number of days between two consecutive records does not exceed 75.
8. The milk record must be performed on all 24 hour milkings of the recorded herd; the time at which the recording is performed must be registered.
9. When at the recording visit the animal is found to have dried-off, the date of the drying-off of that animal is fixed at 14 days after the date of the last milk recording when she was still in milk.
10. In case the animal is found to have dried-off after the longer recording interval (46-75 days), the milk recorder is requested to ask the farmer the effective date for the drying-off. If the effective date falls within 30 days from the last recording, the date of the drying-off of that animal is fixed at 14 days after the last recording; otherwise, it is fixed at 44 days after the date of the last milk recording when the animal was still in milk.

Data processing

The organisation in charge is responsible for collecting and processing all the information registered by the technician.

The organization in charge will process and calculate the following:

1. Milk production of each buffalo during all the days she was in milking (total lactation production).
2. Milk production of each buffalo from calving to 270 days (270 days milk production).
3. Average values of total lactation production and 270 days milk production by herd, village, total covered area.
4. Average age at calving by herd, village, total covered area.
5. Average number of calvings by herd, village, total covered area.
6. Average days open by herd, village, total covered area.
7. Average days of lactation by herd, village, total covered area.

Parameters 1 and 2 will be used to produce individual buffalo certificates and will be processed whenever requested by the farmers.

Parameters from 3 to 7 will be processed at periods fixed by the organization in charge, according to the needs of the participating herds. In any case, annual average values of parameters 3 to 7 will be calculated for the total covered area to be sent yearly to ICAR.

Calculation of total lactation production will be done as follows:

- a. Partial production from calving to first milk recording: multiply milk production at first recording by the number of days from calving to first recording.
Example: date of calving 10 March; date first recording 6 April; milk production on 6 April: 3.2 kg. Therefore, partial production from calving to first milk recording = 3.2 kg x 27 days = 86.4 kg.
- b. Partial production during all milk recordings: multiply the average milk yield of two subsequent recordings by the interval between the two recordings.
- c. Partial production from last milk recording to drying-off day: multiply milk production at last recording by the number of days from last milk recording to drying-off.
 1. The date of milk recording when the animal is found to have dried off is 1 February: multiply milk production of last recording by 14 = 2 kg x 14 = 28 kg.
 2. The date of milk recording when the animal is found to have dried off is 23 February and the farmer states that the buffalo dried-off on 20 February: multiply the milk yield of last recording by 30 and add (last recording yield + (last recording yield/2)/2) * 14. Therefore: $(2 * 30) + ((2+1)/2) * 14 = 81$ kg.

Total lactation production is given by the sum of partial lactations (a) + (b) + (c). An example of calculation is reported in table 1.

Calculation of lactation production up to 270 days will be made as follows:

When the buffalo is still in milk at the recording date falling after 270 days, the average milk production of the two recordings bracketing 270 days is multiplied by 270 minus the number of days from the last recording before 270 days.

Example: In the above table the two recordings bracketing 270 days are 23 November (3 kg milk) and 3 January (2 kg milk).

23 November falls 258 days from calving; milk yield up to 23 November is 1 154.1 kg; therefore:

$(270-258) * ((3+2)/2) = 12 * 2.5 = 30$. Then $1 254.1 + 30 = 1 184.1$ kg.

The buffalo in the example will have a total lactation of 313 (or 343) days, total milk yield of 1 284.6 kg (or 1 337.6 kg) and 270 days yield of 1 184.1 kg.

When the buffalo dries-off before 270 days, total lactation yield and 270 days yield have the same value.

Table 1. Example of calculation of total lactation production.

Date of recording		Milk yield kg		Interval (days)		Average kg milk of two subsequent recordings		Yield of two subsequent recordings kg	Cumulative yield kg
10 March		Calving		27		3.2		86.4	
6 April		3.2		40		3.2		128	214.4
16 May		3.2		37		3.55		131.35	345.75
22 June		3.9		38		4.45		169.1	514.85
30 July		5.0		42		5.75		241.5	756.35
10 September		6.5		37		6.25		231.25	987.6
17 October		6.0		37		4.5		166.5	1 154.1
23 November		3.0		41		2.5		102.5	1 256.6
3 January		2.0		299 days					
1 February		dried		14		2		28.0	
	23 February		dried		44		2+1.5		81.0
Sum				313	343			1 284.6	1 337.6

Lactation production of 270 days must be equal to or lower than total lactation production, never higher.

Note 1: Lactation milk yields, both total and of 270 days, are production parameters; they are not meant to express the genetic merit of the buffalo. Therefore, they should not be projected using extension factors. In case the lactation is very short for involuntary reasons, the reason will be mentioned in individual certificates by a code to be indicated beside the individual production e.g. (1) = sale; (2) accident, etc.

Note 2: When the 270 days milk production is used to calculate the average values by herd, village and total covered area, only the information from lactations having reached a minimum of 150 days will be used.

The responsible organization should produce three types of output:

1. Feedback reports to the farmers to help in management decisions. The reports should include: 1. Individual productivity sheets for each animal, including: genealogy; date of birth; date of calvings; total lactation production (number of days and total produced milk) for each lactation; 270 days lactation production (number of days and total produced milk) for each lactation; indication of interrupted lactation. 2. Average values of total lactation production, number of days in milking, 270 days lactation production (*), calving intervals, age at first calving, lactation number, by herd.
2. Information on buffalo milk productivity at village, region and/or national levels to extensionists, dairy industry, government authorities and policy-makers including: (average values of total lactation production, number of days in milking, 270 days lactation production (*), calving intervals, age at first calving, lactation number by village, area).
3. Information on buffalo milk productivity in the covered area to ICAR for international comparisons (same parameters as in 2.).

(*) Only the lactations over 150 days will be considered when the average 270 days production is calculated.

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Output produced by the responsible organization

Acknowledgement
