INTERPRETATION OF FREEZING POINT DEPRESSION IN MILK

APRIL 2026

Summary

- This industry standard reviews the interpretation of freezing point depression in milk in Great Britain.
- It replaces the interpretation provided in the Dairy UK/NML industry standard "Interpretation of Freezing Point Depression in Milk" from 2021.
- The assumption underlying the revision of the FPD interpretation is that changes constitute a natural phenomenon and are not a reflection of increased/decreased inclusion of extraneous water in milk, i.e. the FPD of 'genuine' milk in GB has changed to a 'new normal'.
- Over the period from 2021 to 2025, the average FPD in Great Britain has increased from 516 m˚C to 520 m˚C and the operational threshold (set at -3 standard deviations from the average) has shifted from 505 m°C to 506 m°C.
- New interpretation limits have been set in line with the approach followed by the 2021 industry standard.
- The average and the standard deviations will continue to be reviewed annually and Dairy UK members will consider the need for further changes in full transparency with relevant stakeholders.

From 01/08/2026, GB milk is considered acceptable if it records an FPD of 506 m°C or above.

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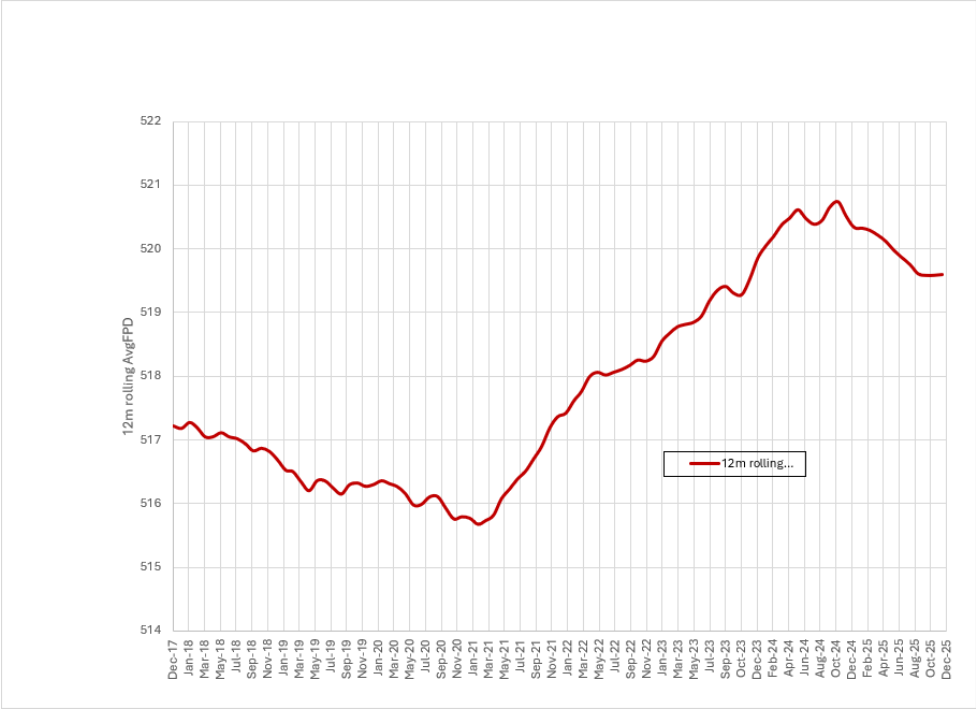
SECTION 1: BACKGROUND

- Freezing point depression (FPD) is a required quality standard for milk. It is used as an indicator of possible presence of extraneous water in milk.
- The legal standard is set out in Regulation (EU) 1308/2013 Annex VII, part IV (now transposed in GB legislation). This regulation stipulates that: "*Drinking milk shall have a freezing point close to the average freezing point for raw milk recorded in the area of origin of the drinking milk collected*".
- Since 2021, British milk has been considered acceptable if it records an FPD of 505 m°C or above. The rationale for this is included in the Dairy UK/NML industry standard "Interpretation of Freezing Point Depression in Milk" (2021), which replaced British Standard (BS) 3095: Part 2: 1988.
- Since then, a dedicated Dairy UK working group has reviewed FPD data on an annual basis to determine the continued appropriateness of the standard. The group agreed to revise the current standard if the operational threshold (m -3SD) had sustained the same integer change (rounded to the lowest integer) over two consecutive years.
- The conditions for revision have now been met, and this document outlines the updated interpretation of FPD in milk.
- The FPD is expressed in thousandths of a degree Celsius, i.e. as a whole number without positive or negative signs, e.g. 506 m°C, and - to avoid confusion - is reported as m°C (Hortvet).

SECTION 2: TRENDS IN FPD IN GREAT BRITAIN: 2021-2025

- The trend seen in FPD results from 2021 to 2025 (obtained from the testing of farm bulk tank samples in England, Scotland and Wales by NML) is illustrated in the graph below:



Source: NML data

- Over the period 2021 to 2025, the average FPD has risen from 516 m˚C to 520 m˚C.
- The assumption underlying the revision of the FPD threshold must be that the change in FPD is a natural phenomenon and not a reflection of increased or decreased presence of extraneous water in milk, i.e. the FPD of genuine milk in GB has changed to a 'new normal'. In practical terms, the quality of the milk will not change as a result of this standard.

SECTION 3: NEW INTERPRETATION OF FREEZING POINT DEPRESSION IN MILK

- Setting new interpretations of FPD in milk – as outlined below - has involved the following steps:
  - The removal of outliers to clean the data – this tackles the issue of inclusion of non-genuine milk samples in the routine NML data by excluding low outlier FPDs from the calculation of the mean and the standard deviation. The best fit between the main body of data and a normal distribution appears when data are excluded from 'mean minus 2sd'.
  - An assessment of the 3-year rolling average for FPDs tested by the mIR method (i.e. covering data from 2023 to 2025) using the 'cleaned' data. Using a 3-year rolling average rather than a 12-month average reduces the sensitivity of the process to abnormal events and ensures that any changes to interpretation of FPD in milk reflect a sustained and well-established change.
  - Interpretation limits are then determined in line with those set out in the 2021 industry standard. The new interpretation limits are set in **Table 1** below.
- This new interpretation applies to Great Britain as data was sourced from this area - Northern Ireland is a geographically separate region with a different climate and it may not be appropriate to extend the conclusions of this new data across the UK. Northern Ireland processors may decide to adopt the standard using local data to check the comparability of the results.
- The rolling average and standard deviations covering the previous three years up to the end of September will be reviewed annually from 2027 and Dairy UK members will consider the need to change the threshold for the year ahead in November with any adjustment applying from 01 April. This allows for communication to farmers by the end of December with a 3-month notification period.
- Dairy UK will be responsible for overseeing the decision-making process and will communicate any updates to relevant stakeholders by the end of November.
- Any decision to change the standard will be made annually by the end of November and notification of the change will be through a statement shared through relevant industry channels.

From 01/08/2026, GB milk is considered acceptable if it records an FPD of 506 m°C or above.

Table 1: Interpretation limits applicable from 01/08/2026[1]

Mean	519.9		**Interpretation**
		≥511	Free of extraneous water
m -2sd	511	510-506	May contain extraneous water
m -3sd	506	505-502	Likely to contain extraneous water
m -4sd	502	<502	Assume presence of extraneous water

SECTION 4: FURTHER INFORMATION

- For more information regarding the background to this standard please contact Dairy UK at info@dairyuk.org

[1] Interpretation applicable to results obtained by thermistor cryoscope method (ISO 5764:2009)