

CALIBRATION OF THERMOMETERS IN VARIED ALTITUDES



Calibration of thermometers can be affected when the boiling point of water is used in an area of high altitude

Calibration requirements

Businesses that are licensed with the NSW Food Authority are required to maintain a calibration program

A calibration program should be implemented to:

- identify equipment used by the business which require calibration and are necessary for ensuring food safety (e.g. hand held thermometers, fridge, freezer and cool room thermometers),
- document the frequency and responsibility for calibration (e.g. 6-monthly by an external contractor),
- specify the temperature ranges of calibration (i.e. hot and/or cold),
- document the acceptable margin of error and appropriate corrective action for non-compliance with this tolerance (e.g. discard or re-calibrate), and
- maintain calibration records.

Calibration at high altitudes

Australian mountain ranges do not have sufficient height to cause the problems in cooking seen on Everest or in Colorado due to reduced boiling points but they are high enough to interfere with thermometer calibration.

Water will boil at temperatures around 94°C at the highest towns in NSW and if the expectation is 100°C then thermometers appear to exceed the +/- 1°C tolerance.

Recommendation

Those calibrating thermometers and undertaking internal and external audits should note the reduced boiling point of water at higher altitude towns in Table 1



Department of
Primary Industries
Food Authority



Table 1: Approximate boiling point of water for higher towns in NSW

Town	Elevation	BP C	Town	Elevation	BP C
Perisher Village	1721	94.2	Cullen Bullen	879	97.1
Cabramurra	1461	94.9	Blayney	874	97.1
Thredbo Village	1447	95.2	Wentworth Falls	871	97.1
Guyra	1336	95.5	Orange	869	97.1
Oberon	1103	96.3	Berridale	862	97.1
Nimmitabel	1082	96.3	Clifton Grove	855	97.1
Mount Victoria	1071	96.3	Tenterfield	851	97.1
Glen Innes	1071	96.3	Captains Flat	848	97.1
Blackheath	1067	96.3	Taralga	842	97.1
Medlow Bath	1064	96.5	Bendemeer	826	97.3
Walcha	1047	96.5	Cooma	793	97.3
Adaminaby	1026	96.5	Tingha	786	97.3
Katoomba	1025	96.5	Batlow	780	97.3
Uralla	1004	96.5	Delegate	761	97.6
Armidale	982	96.8	Dorrigo	755	97.6
Lakewood Estate	970	96.8	Gilgai	741	97.6
Millthorpe	969	96.8	Robertson	731	97.6
Deepwater	967	96.8	Lawson	728	97.6
Spring Hill	947	96.8	Exeter	712	97.6
Portland	944	96.8	Bombala	701	97.6
Jindabyne	918	96.8	Bungendore	695	97.6
Lithgow	916	96.8	Wingello	685	97.8
Wallerawang	898	97.1	Bowral	681	97.8
Crookwell	896	97.1	Moss Vale	678	97.8
Emmaville	886	97.1	Perthville	678	97.8



Table 2: Boiling point of water at varying altitudes

Altitude (m above sea level)	Boiling Point °C	Altitude (m above sea level)	Boiling Point °C
0	100.0	1143	96.0
76	99.7	914	96.8
152	99.5	991	96.5
229	99.2	1067	96.3
305	98.9	1219	95.7
381	98.6	1295	95.5
457	98.4	1372	95.2
533	98.1	1448	94.9
610	97.8	1524	94.7
686	97.6	1600	94.4
762	97.3	1676	94.2
838	97.1	1753	93.9

About the NSW Food Authority: The NSW Food Authority is the government organisation that helps ensure NSW food is safe and correctly labelled. It works with consumers, industry and other government organisations to minimise food poisoning by providing information about and regulating the safe production, storage, transport, promotion and preparation of food.

Note: This information is a general summary and cannot cover all situations. Food businesses are required to comply with all of the provisions of the Food Standards Code and the *Food Act 2003* (NSW).



**Department of
Primary Industries**
Food Authority

6 Avenue of the Americas, Newington NSW 2127

PO Box 6682, Silverwater NSW 1811

T 1300 552 406

contact@foodauthority.nsw.gov.au

ABN 47 080 404 416

More resources at foodauthority.nsw.gov.au



nswfoodauthority



nswfoodauth

October 2015
NSW/FA/FI235/1510