



February 6, 1997

All Chief Environmental Health Officers

Re: Dishwasher Sanitization Equivalents

The *Food Premises Regulations* states that utensils for serving food shall be pre-rinsed or pre-scraped to remove food particles and soils and ...sanitized by any bactericidal process approved by the Medical Health Officer provided that the final test for asepsis and cleanliness shall be free from pathogenic bacteria, chemical reagents and other foreign material. FOODSAFE recommends that hot water sanitization systems use temperature/time combinations of 180°F for 12 seconds or 170°F for 2 minutes. These high temperature guidelines mean that some dishwashers used in semi-commercial/non-commercial settings such as church kitchens are unsatisfactory for food preparation applications.

The National Sanitation Foundation (NSF), Standard No. 3 for Commercial Spray Type Dishwashing Machines provide alternative time/temperature combinations for heat sanitation of utensils in dishwashers. NSF recognizes that vegetative pathogens are destroyed during long exposure at 143°F and shorter exposures above 165°F. As such, they have assigned a heat unit equivalent of 1.0 for the exposure of a plate surface to 143°F for 1 second. Likewise, they recognize that exposure to 165°F for 1 second has a heat unit equivalent of 346.8. The enclosed table provides heat unit equivalents for temperatures between 143°F and 165°F and above.

When sufficient time, in seconds, has passed to provide a cumulative heat unit equivalent of 3600, heat sanitation is deemed to have occurred. For example, holding the surface of a plate at 140°F for 3600 seconds provide a heat equivalence of 3600 and therefore provide adequate sanitary effect. Likewise, holding the surface of a plate at 165°F, or higher for 11 seconds has an equivalent sanitation effect.

Environmental Health Officers must be cautious when using this approach. Heat equivalent units need to be determined at the utensil surface in a fully loaded dishwasher system following minimum wash temperatures. A large load of plates washed at lower than usual temperatures will significantly increase the sanitation period required over a partially loaded dishwasher operating at higher wash temperatures.

This table provides you with an alternative, scientifically based procedure for determining the heat sanitization effect within dishwashers. This may be useful when trying to evaluate the effectiveness of alternative sanitary procedures found in the field. Should you have any questions in this regard, please do not hesitate to contact me at 660-0260.

Yours truly,

A handwritten signature in black ink, appearing to read "S. Buchanan", with a long horizontal flourish extending to the right.

Stephen M. Buchanan, B.Sc., P. Ag.
Food Safety Specialist

SMB/sc/2088b

Enclosure

Annex A

Heat Unit Equivalent (HUE) values corresponding to temperature in degrees Fahrenheit

TEMP	HUE Value	TEMP	HUE Value
143.0	1.0	160.9 --	116.7
143.5 --	1.1	161.0 --	119.9
144.0 --	1.3	161.1 --	123.1
144.5 --	1.5	161.2 --	126.4
145.0 --	1.7	161.3 --	129.8
145.5	2.0	161.4 --	133.3
146.0 --	2.2	161.5 --	136.9
146.5 --	2.5	161.6 --	140.6
147.0 --	2.9	161.7 --	144.4
147.5 --	3.3	161.8 --	148.2
148.0 --	3.8	161.9 --	152.2
148.5 --	4.3	162.0 --	156.3
149.0 --	4.9	162.1 --	160.5
149.5 --	5.7	162.2 --	164.9
150.0 --	6.5	162.3 --	169.3
150.5 --	7.4	162.4 --	173.9
151.0 --	8.4	162.5 --	178.5
151.5 --	9.6	162.6 --	183.3
152.0 --	11.0	162.7 --	188.3
152.5 --	12.5	162.8 --	193.3
153.0 --	14.3	162.9 --	198.6
153.5 --	16.4	163.0 --	203.9
154.0 --	18.7	163.1 --	209.4
154.5 --	21.3	163.2 --	215.0
155.0 --	24.4	163.3 --	220.8
155.5 --	27.8	163.4 --	226.8
156.0 --	31.8	163.5 --	232.9
156.5 --	36.3	163.6 --	239.1
157.0 --	41.4	163.7 --	245.6
157.5 --	47.3	163.8 --	252.2
158.0 --	54.0	163.9 --	259.0
158.5 --	61.7	164.0 --	265.9
159.0 --	70.5	164.1 --	273.1
159.5 --	80.5	164.2 --	280.4
160.0 --	91.9	164.3 --	288.0
160.1 --	94.4	164.4 --	295.7
160.2 --	96.9	164.5 --	303.7
160.3 --	99.5	164.6 --	311.9
160.4 --	102.2	164.7 --	320.3
160.5 --	105.0	164.8 --	328.9
160.6 --	107.8	164.9 --	337.7
160.7 --	110.7	165.0	346.8
160.8 --	113.7		

*The maximum number of heat unit equivalents cannot exceed 346.8 for any single point.