

# FORMULA:

$$C = X_W C_W + X_P C_P + X_{CH} C_{CH} + X_G C_G + X_c C_c$$

Cp del agua(a)  $W = 4.0817 - 0.0053062 \cdot T + 0.00099516 \cdot T^2$

Cp del agua(b)  $W = 4.1762 - 0.000090864 \cdot T + 0.0000054731 \cdot T^2$

Cp de la proteína  $P = 2.0082 + 0.0012089 \cdot T - 0.0000013129 \cdot T^2$

Cp de la grasa  $G = 1.9842 + 0.0014733 \cdot T - 0.0000048008 \cdot T^2$

Cp de carbohidratos  $CH = 1.5488 + 0.0019625 \cdot T - 0.0000059399 \cdot T^2$

Cp de la ceniza  $C = 1.0926 + 0.0018896 \cdot T - 0.0000036817 \cdot T^2$

Cp del hielo  $C = 2.0623 + 0.0060769 \cdot T$

**Table 16.3 Specific Heat of Different Food Components as a Function of Temperature**

Component	Temperature Function	Standard Error	Standard % Error
Protein	$c_p = 2008.2 + 1.2089T - (1.3129 \times 10^{-3})T^2$	0.1147	5.57
Fat	$c_p = 1984.2 + 1.4733T - (1.3129 \times 10^{-3})T^2$	0.0236	1.16
Carbohydrate	$c_p = 1548.8 + 1.9625T - (5.9399 \times 10^{-3})T^2$	0.0986	5.96
Fiber	$c_p = 1845.9 + 1.8306T - (4.6509 \times 10^{-3})T^2$	0.0293	1.66
Ash	$c_p = 1092.6 + 1.8896T - (3.6817 \times 10^{-3})T^2$	0.0296	2.47
Water <sup>a</sup>	$c_p = 4081.7 - 5.3062T + (9.9516 \times 10^{-1})T^2$	0.0988	2.15
Water <sup>b</sup>	$c_p = 4176.2 - (9.0864 \times 10^{-2})T + (5.4731 \times 10^{-3})T^2$	0.0159	0.38
Ice	$c_p = 2062.3 + 6.0769T$		

Source: Adapted from Choi, Y. and Okos, M.R., in *Food Processing and Process Applications Vol. I Transport Phenomenon*, Elsevier, New York, 1986.

<sup>a</sup> For a temperature range of  $-40^\circ\text{C}$  to  $0^\circ\text{C}$ .

<sup>b</sup> For a temperature range of  $0^\circ\text{C}$  to  $150^\circ\text{C}$ .