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Pflug, Irving J: (2003). Measuring the Thermal Resistance of Microorganisms: Selecting an Appropriate Test System, Correcting for Heat Transfer Lags, Determining Minimum Heating Times. *PDA J. Pharm. Science and Technology*. 57(3):160-185.

### **Abstract**

Errors that occur in physical systems used to evaluate the heat resistance of microorganisms are discussed: namely, (a) not knowing the test heating-medium temperature accurately, (b) using heating times that are so short that the maximum temperature reached in the test unit is significantly below the test heating-medium temperature, and (c) ignoring significant heat-transfer lags, first in the heating and later in the cooling of the test units. Procedures and methods that can be used to minimize the effect of potential test-system errors on microbial resistance data are reported. Examples are included regarding the treatment of the different types of errors. Heating and cooling lag-correction values for several commonly-used testing systems, gleaned from the published literature and from the author's experience, are listed. A method is described and illustrated regarding how we may determine (in advance of carrying out an experiment to gather enumeration or survivor-curve data), the shortest heating time--highest temperature that should be used with a specific test-unit system and microbial DT -value.

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