



# Worthwhile Operational Guidelines & Suggestions

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## HOW DO YOU SAMPLE?

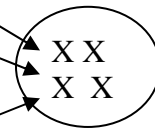
Sampling is a common procedure used to collect information about a process or a batch of product. Sampling is necessary because often it is not possible or practical to examine the entire process or a lot of product. **Wrong sampling plans and samples lead to wrong inferences!** Imagine sampling a lot of ready-to-eat product for *Listeria*. The samples taken from this lot for microbiological testing should reflect, as much as possible, the true composition of the entire lot. Otherwise, we make a wrong judgment about the safety of this lot.

How do we, then, draw a representative sample? How do we avoid bias?

Random sampling is a universally recognized way of avoiding bias, in which each sample unit (a carcass, piece of product or a package) has equal opportunity to be selected.

**Simple random type of sampling** can be used in instances where the process or the product is fairly homogenous. Table of Random numbers or computer generated random numbers may be used for this purpose. **Systematic or stratified random sampling** used when there is a distinct and non-overlapping stages or layers in the process or product. In this case random samples are drawn from each layer, so that each stage has an equal opportunity to be represented in the final sample. This type of sampling is used when there is prior knowledge of heterogeneity or known sources of

X	X	X	X	XX	X
XX	XX			X	
	XXX	X		X	
X	X	XX			
XX	X		XXX		
X	X	XXX	X		
X	XX		XX		
	X	X	XX	XX	



variation in the process or product (i.e., sampling product from different shifts or cooking lines). The results from different strata should be assessed separately and then pooled if it is homogenous. Selecting the right sampling plan is critical in ultimately making the correct decision(s). In many instances, increasing the sample size alone, with little regard to proper sampling plan, will not add to accuracy. Remember, the reliability only increases roughly as the square root of the number of sample units (four fold increase in sample size will only halve the likelihood of making wrong decision!).



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