Chapter 4

Air and Surface Sampling

A number of air sampling techniques have been developed for the sampling of airborne bacteria. The basic methods employed include sedimentation, impaction upon solid surfaces, impingement into liquids and filtration. A variety of equipment is also available for sampling of airborne particulates. With regard to surface sampling of microbial contamination one of three basic methods is usually employed; swabbing, agar plate impression, or the direct surface agar contact plate method. Illustrations of equipment employing bacterial impaction upon solid surfaces, airborne particulate sampling and direct contact plates are included in this chapter.

A discussion on "air and surface sampling techniques" by Marcus M. Jensen, Ph.D., Microbiologist1, is also included as a basic reference for those interested in applying these methods. Dr. Jensen also includes suggestions for testing of installed air handling systems.

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The Andersen sampler collects six size-graded aerosol particles in a cascaded arrangement of sieves which have smaller diameter holes in each succeeding plate. Agar in petri dishes are located under each sieve. It has found wide acceptance for sampling viable aerosols when it is desired to estimate the numbers and sizes of the actual airborne particles, rather than the total number of viable cells in those particles, as yielded by liquid impingers.

It samples at the rate of one cubic foot of air per minute and will detect one or tens of thousands of viable particles in a sample. The cascade units are available with or without a vacuum pump. In some cases when simultaneous sampling is required the basic cascade units are connected to a manifold by Tygon tubing and flow meters. The manifold in turn is connected to a vacuum pump or central vacuum source. See Figures 4-1, 4-2, 4-3 and 4-4.

Fig. 4-1. Andersen sampler-basic unit. Courtesy Andersen 2000 Inc.