Drug Chemistry Section
Drug Chemistry Procedure Manual
Effective Date: September 1, 1996

Name of Procedure:

Random Sampling
Random Sampling of Multiple Packages or Units

Suggested Uses:

Random sampling is a procedure that is used when analyzing an item of evidence that consists of multiple packages or units. This procedure allows a chemist to determine the composition of the evidence by analyzing some randomly selected packages or units and extrapolating the results. Random sampling is an accepted procedure used in forensic science and has been upheld by the Appellate Courts of North Carolina (see literature references).

Random Sampling Procedures:

1. Visually examine all of the packages or units in the item of evidence, as well as the contents, for differences in size, weight, color, packaging, markings, signs of tampering, labeling or other characteristics. If there are no appreciable differences, all of the packages or units should be considered together for the selection of random samples. If there are appreciable differences, segregate the packages or units into individual groups, based upon such observed differences.

2. To determine the number of random samples to be selected from a total number of packages or units, where **n** equals total number of packages or units:

   a. If **n** is less than or equal to 4, then random sampling is not done.
   b. If **n** is greater than or equal to 5, then the number of random samples selected is equal to the square root of **n** plus 1, expressed as:

$$\text{random samples} = \sqrt{n} + 1$$

   c. Weight determination - the total weight of all packages or units may be extrapolated from the weight of a random sample of the packages or units.

   d. Weight count - the total number of all packages or units may be extrapolated from the weight of a random sample of the packages or units.

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Classification of Evidence:

There are three main forms of controlled substances:

1. Plant material.

2. Controlled substances consisting of marked dosage units from legitimate pharmaceutical manufacturers.

3. Controlled substances derived from clandestine manufacturers.

    a. Packages or units containing powder or solids.
    b. Packages or units containing liquid.
    c. Packages or units consisting of any substance which is used as a median to absorb or contain a controlled substance (plastic bags, glassine bindles, paper bindles, blotter paper, gelatin, sugar cubes, tea leaves, parsley, etc.)

Application of Procedure on Evidence:

1. Random sampling of plant material:

    a. Visual examination of all packages or units and a complete analysis of one package or unit is required to confirm identification (minimum requirements).

2. Random sampling of marked dosage units from legitimate pharmaceutical manufacturers:

    a. The visual examination and the markings on the dosage units provide identification of the controlled substance and a complete analysis of one dosage unit is required to confirm identification (minimum requirement).

3. Random sampling of controlled substances derived from clandestine manufacturers:

    a. Random samples of packages or units must be selected and subjected to at least one screening test. A complete analysis of a portion of the random samples is required to confirm identification (minimum requirement).

Safety Concerns:

Not applicable.

Literature References:

Colon, Rodriguez, and Diaz, "Representative Sampling of 'Street' Drug Exhibits," **Journal of Forensic Sciences**, Vol. 38, No. 3, May 1993, pp. 641-648.

Siegel, and Saferstein, "Forensic Identification of Controlled Substances," **Forensic Science Handbook**, Vol. 2, Prentice Hall, 1988.

Tzidony and Ravreby, "A Statistical Approach to Drug Sampling: A Case Study," **Journal of Forensic Sciences**, Vol. 37 November, 1992, pp. 1541-1549.

Frank, Hinkley, and Hoffman, "Representative Sampling of Drug Seizures in Multiple Containers," **Journal of Forensic Sciences**, Vol. 36, March 1991, pp. 350-357.

Waggoner, R.W., "*t* Distribution and Prediction Intervals," North Carolina State Bureau of Investigation, 1996.

State v. Myers, 301 S.E. 2d 401, 402 (N.C. App. 1983)

State v. Wilhelm, 296 S.E. 2d 664, 667 (N.C. App. 1982)

State v. Absher, 237 S.E. 2d 1325, 1328 (N.C. App. 1977)

State v. Clark, 197 S.E. 2d 81, 82 (N.C. App. 1973)

Literature References (continued):

State v. Riera, 172 S.E. 2d 535, 539 (N.C. App. 1970)

State v. Harding, 429 S.E. 2d 416 (N.C. App. 1993)