employ a statistical approach to finding patterns in the data. Problems include the need to clarify who provided what data for which analysis, i.e., how much overlap was there among the three herbalists interviewed, those who donated manuscripts of prescriptions, and those who assisted with collecting plant specimens?

Catherine Pake
Department of Ecology & Evolutionary Biology
University of Arizona
Tucson, AZ 85721

Nutricomp (software). Joseph E. Laferriere. Nutricomp Program, $35.00; Database CULTIV, $25.00; Database SW, $60.00. (Order from the author at the Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ 85721.)

This is new for both of us: writing a software review for publication. Pooling Duke's experience with nutritional data and Perry's experience with computers, we offer our first software review.

The *Nutricomp* software is a series of ten programs and seven databases allowing storage, retrieval, and analysis of nutritional information on plants, animals, and fungi. Our software came with a database that contained a wide array of references, nutrients, and taxa, including more analytical data than Duke and Atchey's *CRC Handbook of Proximate Analyses Tables of Higher Plants* (Boca Raton, FL: CRC Press, 1986). *Nutricomp* can accommodate proximate analyses (including ethanol), 13 vitamins, 17 minerals, 28 lipids, 18 carbohydrates, and 22 amino acids for over 1,000 species (though none of the samples we printed had *all* this analytical material).

Written in interpreted BASIC, the software runs on a computer with an MS-DOS operating system and BASICA or GW-BASIC. Just as each program performs a specific task (such as indexing, deleting, menu operations, reporting, etc.), each database stores certain information, e.g., nutrient compositions, standard nutrient values, names of added nutrients, references, and taxa. We tested the software on a Compaq 386/20 microcomputer, three megabytes (MB) of memory, a 130 MB harddisk, GW-BASIC, and the DOS 3.32 operating system.

General operation of the software was fine. After initial orientation, menus and prompts were easy to follow. Although the 15-page NC.DOC file containing documentation did not easily orient the non-nutritionally-focussed user to the overall arrangement of software operation, it did provide most of the information that was needed for software operation.

After entering the program by using a batch file which loads BASIC and the programs and then runs the initial menu program, the user can add, change, view, delete, report, calculate meal composition, alphabetize (sort the taxa and/or references), link or change databases, and index common names. After either selecting an existing database or creating a new one, information can be added.

Function keys can be used throughout the software to type in the key words—list, any, or add—each of which will display the information under investigation. All functions work well with the appropriate means of stopping when listing. References, taxa, sample preparation techniques, organism part, reporting basis, nutrients, and kilocalories and protein score can be added/modified. When adding new records for each type of information, the reference and taxon information is protected against a code value meaning two different things, but this protection is not present for the nutrients. We added several different nutrients with the same name and were unable to differentiate among them in the list. A very nice feature of the software concerns the units for the nutrients. The software will automatically check the units for certain nutrients and prompt the user for additional information for specific ones, such as vitamins A, D, and E. Older units can be used and will be converted by the program. Similar actions occur with proteins, lipids, and carbohydrates.

Reasonably nice editing is possible before newly entered information is actually written to the disk, but editing of previously entered information by the program is not quite as neat as data entry. If something is wrong with part of the taxon or reference entry, that part must be retyped; however, these two files can be modified with ASCII text editing software outside of *Nutricomp*. Various modifications of numerical data will naturally change other data that were calculated by the program. The author clearly states the results of these changes in the documentation.

Information on the screen is examined by answering various questions that help narrow down the information selected. Prompts are provided for taxa, parts, preparation techniques, and nutrients. Selection of these is easy with the use of code numbers and the ability to list the values of the codes.

Printing appropriate information was most difficult. The program provides options for listing all information in the databases by taxon or reference, or allows selection of information on the disk by selecting nutrient or numerical data. The reference and taxon options print all this information with no provision for stopping the listing. We were unable to get the program to eject a page correctly; it always printed ten lines on the next sheet of paper and then ejected, but only when printing reference lists. We also tried to select only the data in the database by nutrients. The documentation indicated that only those records that have information for the nutrients selected will be printed. We found several species listed that did not have data for our selected nutrients, and not all of the taxa for which we knew data were available were listed. When printing, we encountered a blank screen, and did not realize what was happening. A message indicating that printing is underway would be informative.

Laferriere warns us to take his numbers with a grain of salt. Checking his data against Agriculture Handbook Number 8 (AH-8), we found his transcription of AH-8 data to be more accurate than our own. Laferriere converted AH-8 data to dry matter basis. For *Brassica oleracea* var. *acephala*, we find only one erroneous transcription (leucine) out of 42, whereas we had made two errors in our own transcription.

In general, other activities worked as indicated in the documentation, with some general deficiencies. There are no help screens to assist if the user gets stuck

and does not know what to do. Also, the software is slow, even on the exceptionally fast machine on which it was tested. Still, this is a better buy for the money than Duke and Atchley's book.

James A. Duke
U.S.D.A.
Building 001, Room 133
BARC-West
Beltsville, MD 20705

Mark C. Perry
U.S.D.A.
Building 001, Room 139
BARC-West
Beltsville, MD 20705