

# 17

## CONSTRUCTING TABLES

Gamini Seneviratne

*Microbial Biotechnology, Institute of Fundamental Studies, Kandy.*

The heart of every research project is its data, the information that gives rise to conclusions. However, without proper presentation, the data can be misinterpreted or, even ignored. When tables are used, authors must construct them well to display the data and to summarize information. Tables have three main purposes and advantages over text:

- They portray complex data in a way that is easier to interpret and understand
- They reduce reading time by summarizing and highlighting key findings so that they are readily visible
- They reduce the overall word count

These visual aids enrich the readers' understanding and improve the accuracy of their interpretations of the data. Thus, it is imperative that the quality of tables that are submitted to and published in scientific theses and journals be carefully considered and for data to be presented in such a way that strengthens the overall manuscript.

### Introduction to Tables

When a table is used, do not repeat exactly what is said in the text; you should call attention to or interpret its main points. A table should be able to stand alone, that is, to communicate facts without referring to the text. Background material such as information on how an experiment was conducted will be given in the text, but the reader should be able to interpret data presented in a table without referring to the text. Abbreviations that cannot be used in the text are sometimes appropriate for tables, but meanings which are not immediately clear should be defined in the caption, in headnotes, or in footnotes. For clarity and understanding, a table may repeat information in more than one form. In addition to the absolute values presented, it may give percentages, totals, means, averages, or ratios of those values.

Authors are more likely to include too much rather than too little information in a table. Limit the items in the field, especially in tables used for presentations. Often, full columns of information can be omitted. Be suspicious of any column that has few or no data points that differ. A string of zeros or any number in a column that repeatedly notes the same result can often be omitted. A full table consisting

of no more than six or eight data points can usually be replaced by a sentence or two in the text. The same table may serve as a good visual aid in a slide or poster presentation where a full sentence would not as quickly display a fact. Tables are also overloaded when headings and footnotes are too heavy. For example, if an abbreviation is obvious from information in the caption, that abbreviation can be used with no further explanation.

Problems that occur with tables can confuse readers. Errors can occur easily in transferring data to a table or in subsequent revisions. Captions, like titles, are sometimes too long and wordy; they should be concise and contain only the key words needed to clarify the message in the field of data. Numbers should show no more decimal places than are essential for reasonable precision and accuracy (see Chapter 13). As with other communication, try to consider your tables from the viewer's perspective. Make them precise, concise, and as simple as possible.

## Parts of a Table

The following Table 1 briefly illustrates the main parts of a table and the terminology used to name those parts:

**Table 1.** The main parts of a table and the terminology used to describe them

Stub head <sup>b</sup> ( <i>Independent variable</i> )	Spanner 1 <sup>a</sup>			Spanner 2		
	Column head <sup>c</sup>	Column head	Column head	Column head	Column head	Column head
	( <i>Dependent variable</i> )					
Row head (Optional)						
Row subhead	xxx	xxx*	xxx	xxx	xxx	xxx
Row subhead	xxx	xxx	xxx**	xxx	xxx	xxx
Row subhead	xxx	xxx <sup>d</sup>	xxx	xxx	xxx	xxx

*Note.* A general note is placed here.

<sup>a</sup> The first specific note should begin with a new line. <sup>b</sup> The second specific note goes here.

<sup>c</sup> Longer specific notes may carry over to the next line. <sup>d</sup> The fourth specific note goes here.

\* $p < .05$ . \*\* $p < .01$ .

Many computer programs provide an option to use grids to plot data. Look at the theses and journals published in your discipline. Unless they regularly publish tables on grids, do not choose this option.

The spanner heading identifies items in columns, which should be the dependent variables, and the stub column heading identifies the independent variables for items in horizontal rows. Comparisons between like elements in the data should be made down columns, not across rows. A spanner heading should define the meaning of the items in the field by indicating whether those items are percentages, yields, concentrations, or other measures. Any subordinate heading simply adds precision to the main head. Use as few headings as possible to communicate clearly; only rarely should you go beyond tertiary headings. Be sure to include units of measure. For example, the main heading might read "Chlorine/mg L<sup>-1</sup>"; numbers in the field would be rather meaningless without the 'mg L<sup>-1</sup>'. The sequence of footnotes is carried horizontally across each line of entries from top to bottom in the table. Unless your instructions specifies otherwise, you can use the following guidelines for tables.

The essential components of a Table are:

**Table number and title.** All the tables should be numbered and they should correspond to the reference in the text. The title should convey the contents of the table and any abbreviations should be explained. The title is placed above the table.

**Dividing lines.** A table contains no vertical lines. It usually has only three horizontal lines (shown bold in Table 1), which run the full width of the table: one beneath the table title and any headnotes, one beneath the headings for the stub and the field, and the third below the field and before any footnotes. Other horizontal lines, called straddle rules or spanners, run across all the columns of field items to which the heading above the spanner refers to.

**Spanner.** The spanner is a common heading bringing together the common elements in adjacent columns. Units common to the columns can be included here. The spanner rule or line is placed below to cover the common columns.

**Column head.** This identifies the data entered under each column. All columns should contain a heading and the units of measurements are in parentheses. If only units form the column headings, parentheses are omitted. The data entered under the column are the dependent variables.

**Stub head.** The column on the left of the table is the stub and contains the independent variable. It should also have a column heading. The stub contains the row heads (words or short phrases) to identify the entries of that row. A row head may contain row sub-heads of different data types, but common to the row head, which are indented.

**Field.** This contains the data to be presented, which can be numbers, text or symbols.

*Notes.* General notes are those that explain or provide information relating to the table as a whole. They should end with any explanation of abbreviations or symbols.

## Preparing Tables

The following suggestions should contribute to prepare a decent table and avoid the basic mistakes encountered during correction by your supervisor.

1. Study the theses instructions or style sheet from your department or faculty.
2. Use Arabic numerals to number the tables.
3. Prepare tables with the like items, or items you want to compare, reading down columns, not across lines.
4. Group items logically with control values to establish a baseline for comparisons. Any gradation or trend in data should probably be stressed.
5. Round off numbers. Do not use excessive decimal places. Decimals must be aligned in columns.
6. Be sure the caption is descriptive of the table's contents. No verb is necessary in this caption.
7. Explain in the caption, in headnotes, or in footnotes all non-standard abbreviations and symbols used.
8. Verify all information. Make sure that all data and statistical analyses are accurate. Verify again after any revision or transfer of information.
9. Check tables for accuracy in use of symbols, units of measure, and other labeling. Be consistent with such labeling among all tables and figures in the same text.
10. Proofread carefully.

### Preparing Tables for Presentations and Posters

Most of the previous suggestions apply equally to tables that are used in written reports or for other presentations. The audience for a poster or a presentation is not going to be able to study the table as long as the reader of a manuscript can study it, therefore simplicity is even more essential. In a publication, the use of symbols, shapes, sizes, and especially color may be limited, but the slide or poster can make important use of such symbolic language. If you are selective in the media you use and if you present your most representative data, your tables will lead the reader or viewer to the conclusion reflected by the data.

### Types of Tables

There are two main types of tables used in scientific publications. They are text tables and data tables. Their uses, advantages and disadvantages are summarized in Table 2.

**Table 2.** When and why to use different types of tables

Type of table	When to use it	Advantages and disadvantages
Text table	Comparing different groups such as treatments or inclusion and exclusion criteria, or listing key points.	Summarize points and reduce the word count in the main text.
Data table	To compare multiple groups, show demographic information, or list raw data obtained in a study.	Beneficial when precise values or individual data points are important. Not appropriate for small amounts of data that can be stated succinctly in one or two sentences in the text.

### Summary of guidelines for constructing tables

1. Tables should be accompanied by an explanation in the text of the paper. When you use a table, refer to it in the text beforehand and explain what the data says. Your article might say something like: Table 2 shows initial soil properties of the site studied.
2. Tables should be clearly labeled, using wording that corresponds to the text of your article.
3. A table should be complete with all the information to be understood without reference to the text.
4. Do not repeat the data in a table as a figure.
5. Contents of tables should be kept clear and simple. A table with too much of information is confusing.
6. Each table should come as close as possible after the first reference to it.
7. Each table in your article should be centered horizontally on the page. If a table is very long and narrow, you can save some space and enhance the appearance by doubling it up – dividing the table into equal parts and placing them side by side. Long tables may be continued from page to page of your article. Column headings would need to be repeated on every page; the title should be placed at the beginning of the table; the bottom rule line would only be included on the last page, at the end of the table.
8. Avoid using abbreviations in your tables, but if you must, make sure that they are obvious.
9. Citations for tables must directly follow the table in the text of the article.

10. Avoid the use of pointless tables. If a table does not add new information or highlight important information, leave it out.
11. Do not use a table just to be “fancy”. If you can summarize the information in one sentence, then a table is not necessary.

## **References and Further reading**

1. Davis, M., Davis, K.J. and Dunagan, M.M. (2012) *Scientific Papers and Presentations*. Third edition. DOI: <http://dx.doi.org/10.1016/B978-0-12-384727-0.00011-2>. Elsevier Inc.
2. Franzblau, L.E. and Chung, K.C. (2012) Graphs, Tables, and Figures in Scientific publications: the good, the bad, and how not to be the latter. *Journal of Hand Surgery* 37A: 591–596.
3. Guide for Preparation of Theses and Major Papers. [http://www.minotstateu.edu/graduate/pdf/thesis\\_and\\_major\\_paper\\_guide.pdf](http://www.minotstateu.edu/graduate/pdf/thesis_and_major_paper_guide.pdf) accessed on 17.07.2014