

# Comparing apples and oranges: a randomised prospective study

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For many years the comparison of apples and oranges was thought to be impossible. Many authors use the analogy of the putative inability to compare apples and oranges as a means of scornfully reviewing the work of others. The titles of some recent publications<sup>1 2</sup> suggest an actual comparison of apples and oranges, but the authors do not, in fact, compare these two fruits. Our laboratory has been interested in this problem for many years. We attempted numerous pilot studies (unpublished data) but had not accomplished a true comparison until now. At last, successful comparison of apples and oranges has been achieved and is the subject of this report.

## Methods and results

We investigated many different varieties of apples and oranges in pilot studies; for this study, however, red delicious apples were compared with navel oranges. A total of 12 objects (6 apples, 6 oranges) made up the experimental population. Measurements were performed using a standard tape measure (Pseudoscientific Instruments, Lodi, NJ). Weight was recorded to the nearest tenth of a gram using a scale. Sweetness was quantified by the Licker scale (1 = kind of sweet; 2 = sweet; 3 = very sweet; 4 = really very sweet). Statistical calculations were performed using FudgeStat (Hypercrunch Corporation, Sunnyvale, CA) on an Apple Macintosh 8500 computer (Apple Computer Inc, Cupertino, CA). No significance should be inferred from the type of computer used, nor was any bias introduced because of this. Six oranges and five apples survived the experiment. (Before the study was completed, the author's 12 year old son, Thomas, inadvertently consumed one of the objects, an apple.) Non-parametric background comparisons are shown in table 1. A striking and heretofore unappreciated similarity was noted. In only one category, that of "involvement of Johnny Appleseed," was a statistically significant difference between the two fruits found.

Subjective findings and objective data are presented in table 2. A significant difference between apples and oranges was identified only in the categories of colour and seeds.

## Comment

The study reported herein represents a breakthrough in the comparison of apples and oranges. These two fruits appear to have many features in common, as we noted differences in only three of 15 areas.

A Medline search found 52 publications unrelated to the actual study of fruit with the words "apples" and "oranges" in their titles; most are letters to the editor or editorials. Articles in the medical literature on the subject of apples and oranges are increasingly being published (see figure). Every one of these studies asserts

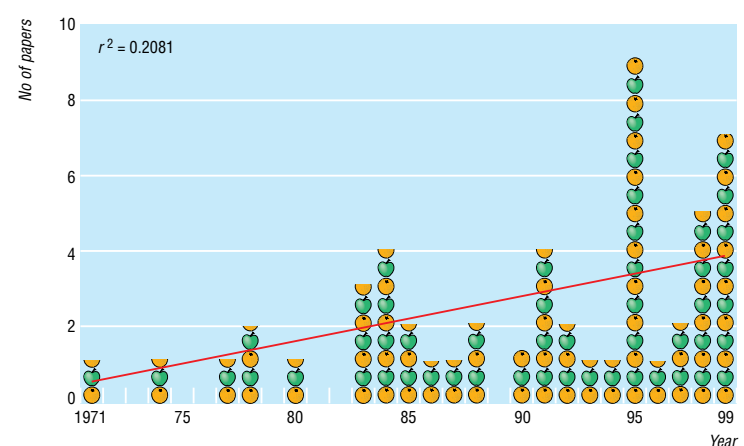
**Table 1** Non-parametric background fructological information

|                                  | Apples | Oranges |
|----------------------------------|--------|---------|
| Grown in orchards                | Yes    | Yes     |
| Flowering trees                  | Yes    | Yes     |
| Considered a fruit               | Yes    | Yes     |
| May be eaten                     | Yes    | Yes     |
| May be made into juice           | Yes    | Yes     |
| Subject to damage by disease     | Yes    | Yes     |
| Subject to damage by insects     | Yes    | Yes     |
| Involvement of Johnny Appleseed* | Yes    | No      |

\*P<0.01.

**Table 2** Subjective and objective comparison of apples and oranges

|                              | Apples     | Oranges    | P value |
|------------------------------|------------|------------|---------|
| Colour                       | Red        | Orange     | 0.03    |
| Sweetness                    | 2+         | 2+         | NS      |
| Shape                        | Sphere     | Sphere     | NS      |
| Mean (SD) circumference (cm) | 25.6 (2.3) | 24.4 (2.6) | NS      |
| Mean (SD) diameter (cm)      | 7.9 (0.6)  | 7.6 (0.7)  | NS      |
| Weight (gm)                  | 340 (87)   | 357 (760)  | NS      |
| Seeds                        | Yes        | No         | 0.03    |



Incidence of "apples and oranges" in the medical literature

**Table 3** Actual subjects of selected papers purported to be comparisons of apples and oranges

| Title of paper   | Actual subject              |
|--|-----------------------------|
| Comparing apples with oranges <sup>1</sup>   | Generalists and specialists |
| Comparing apples to oranges <sup>2</sup>   | Desflurane and propofol     |
| Apples and oranges <sup>3</sup>  | Emergency medical systems   |
| Apples and oranges: flaws and guffaws <sup>4</sup>   | Salmeterol and ipratropium  |
| Comparing apples and oranges in the Plio-Pleistocene: methodological comments on meat-eating by early hominids at the FLK 22 Zinjanthropus site, Olduvai Gorge (Tanzania): an experimental approach using cut-mark data <sup>5</sup> | Self explanatory            |

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## Practice and research

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that a comparison of apples and oranges is impossible. At first glance, some papers seemed to have addressed the important topic of a real comparison of apples and oranges. Table 3 reveals the truth.

This article, certain to become the classic in the field, clearly demonstrates that apples and oranges are not only comparable; indeed they are quite similar. The admonition “Let’s not compare apples with oranges” should be replaced immediately with a more appropriate expression such as “Let’s not compare walnuts with elephants” or “Let’s not compare tumour necrosis factor with linguini.”

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- 1 Johnson W. Comparing apples with oranges. *Arch Intern Med* 1998;158:1591-2.
- 2 Lubarsky DA. Comparing apples to oranges. *Anesth Analg* 1995 Aug;8:428-9.
- 3 Cummins RO, Hazinski MF. Apples and oranges. *Ann Emerg Med* 1999;33:602-3.
- 4 Petty TL. Apples and oranges: flaws and guffaws. *Chest* 1999;116:1137-8.
- 5 Monahan CM. Comparing apples and oranges in the Plio-Pleistocene: methodological comments on meat-eating by early hominids at the FLK 22 Zinjanthropus site, Olduvai Gorge (Tanzania): an experimental approach using cut-mark data. *J Hum Evol* 1999;37:789-92.