

# Anatomy of Journal Article

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# Researchers do not pick up a journal and read it from start to finish ...

- ⇒ The title is likely to be printed in bibliographies and subject indexes, stored in bibliographic databases, and cited in other articles
  - ⇒ These may be a periodical that publishes the tables of contents of other journals, or a carefully annotated and indexed printed bibliography, or a bibliographic database that can be searched electronically
  - ⇒ Secondary sources usually contain only titles, names of authors, publication data, and perhaps abstracts; very few to date contain the full text
- ∴ The more researchers depend on searches through secondary sources  
⇒ the more important it is to us to make sure the contents of those sources are **accurate and effective**

# TITLE

- ⇒ The title is likely to be printed in bibliographies and subject indexes, stored in bibliographic databases, and cited in other articles
- ⇒ On the basis of the title alone, future researchers **may** seek or ignore the full text
- ⇒ A poor title may prevent future researchers from finding important information
- ⇒ Latin name: **may not** be necessary in the title

# Qualities of good title for a research report

- ↪ contains a few words as possible (many journals limit titles to 25 words; some want fewer, 12)
- ↪ describes the contents of the paper accurately
- ↪ describes the subject as specifically as possible within the limits of space
- ↪ avoids abbreviations, formulas, and jargon
- ↪ usually omits the verb
- ↪ is as easy as possible to understand
- ↪ contains key words, for the benefit of information retrieval systems

# Things to watch

- ⇒ cut unnecessary words: “ Some notes on ...”, “Observation on ...”, “A consideration of ...”, “Influence of ...”
- ⇒ revise metaphors: “Man does not live by bread alone: the nutrient of IR64 rice”
- ⇒ revise titles that are too general in wording
- ⇒ normally titles report the subject of the research rather than the results or conclusions
- ⇒ make sure that as many as possible of the key words from the article appear in the title ⇒ will be used to index the article or to find it through computer searching
- ⇒ the important words in the title stand out – usually by being the first words
- ⇒ follows the preference of the journal (e.g. single statement vs. subtitle)

# Unsatisfactory vs. satisfactory titles

## Unsatisfactory

- Protein in rice
- Notes on Indonesian rice as a source of protein
- Some observation on the PER and other qualities of six Indonesian rices
- Rice: truly the stuff of life
- Protein quality and properties evaluated using solubility fractionation, electrophoreses, and gel filtration in Rojolele, Rendah Padang, Serayu, Semeru, and Cisadane High and Normal protein rices

## Suggested by the editor

- Evaluation of protein quality and properties in six varieties of Indonesian rice

# AUTHOR

- be consistent: Suminar S Achmadi, SS Achmadi, **not** Suminar SA
- **no** academic degree
- the names can appear in order of the importance of each author to the work being reported
- include only people who are truly authors:
  - ✓ have made an important contribution to planning and carrying out the research (designing the research, analyzing & interpreting the data), help the draft the article, or have revised important parts of it)
- stated in the acknowledgement: simply gave advice, helped collect data, technicians, sponsors/funding source
- senior author: listed first; usually the person who had the original idea for the experiment and led the investigation, or did most of the research and the writing
- co-author: should give final approval to the version to be published (The editor may wish to have this confirmed)

# Address

- name of the institution for each author
- some journals like to include a full postal address and email address, at least the senior author  $\Rightarrow$  so that readers can write for more information
- the information may appear immediately after the names, or as a footnote on the title page, or as note at the end of the article
- if the author move to another institution:
- the main entry should give the name of the institution where the work was done, followed by the author's current address, possibly in footnote



# ABSTRACT

- ↪ also called “summaries”
- ↪ most journals limit abstracts to 200 words, or fewer; some say it should be no more than 5% of the length of the paper, 400 words—*Soils and Tillage Research Journal*
- ↪ is written in normal language (not as they are in cables)
- ↪ stands on its own. It will be read separately from the paper, in publications like *Biological Abstract*, *Chemical Abstracts*  
⇒ The Abstract must be complete in itself
- ↪ report the objective of the research; its scope; the methods used (by reference if they are standard, or described briefly if they are not; the main results, including any newly observed facts; the principal conclusions and their significance
- ↪ contain all the key words by which the paper should be indexed

# Things to watch in Abstract

- ✎ make sure it is no longer than the publication permits ⇒ cut all unnecessary words
- ✎ make sure it contains all the necessary information
- ✎ if space allows, it should include all new items and observations
- ✎ make sure the abstract can stand alone. Delete:
  - ✎ references to tables or figures that appear in the paper
  - ✎ abbreviations or acronyms unless they are standard or explained
  - ✎ references to literature cited. If a publication must be mentioned, references must be in full (author, title, journal, date, etc.)
  - ✎ any information or conclusions not in the paper itself
  - ✎ general or fuzzy statements or adjectives. Make sure findings are given as hard facts

# DATES

- ⇒ also called the genesis of the manuscript
- ⇒ many journals report the date the manuscript was received in the editorial office and sometimes the date it was accepted for publication
- ⇒ can help establish exactly who was the first to discover something new
- ⇒ indicates when the research was done, which may be important if there has been a long delay in getting published

# KEY WORDS (or KEYWORDS)

- ↗ = indexing term
- ↗ normally 3-6 items
- ↗ consider keyword contained in the title

“A new method for the analysis of solutions containing fluoride”

**VS.**

“Automatic photometric fluoride titration: selective indication by thorium nitrate and alizarin S”

# Examples

*International Journal of Crop Science*, 2007, Vol. x, No y, pp. 93-98  
ISSN xxxx-yyy

## **Maize response to phosphorus application at different levels of residual phosphorus in a Paleudult and a Eutrustox**

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# Example: Abstract

Blend membranes of chitosan and poly(ethylene oxide) (PEO) with different molecular weights of 100,000 and 600,000 were prepared by the solution cast technique. The chitosan-PEO blends membranes were produced to study their water adsorption capacity and characteristics for haemodialysis membrane applications. An increase in the water adsorption capacity of chitosan-PEO blend compared to the pure chitosan was due to the porous structure as evident from the scanning electron micrograph. Addition of PEO with higher molecular weight had reduced the percentage of water adsorption of the chitosan-PEO blend membranes. X-ray diffraction results revealed that chitosan-PEO blend membrane with higher water adsorption ability shows lesser degree of amorphosity. Intermolecular interactions between chitosan and higher molecular PEO chains in the blend contributed to important alteration in chitosan structure as observed in the infrared spectroscopy, limiting the permeability of the membrane.

# Don't and Do

- ... are described
- ... is presented
- effect of chemical A on plant B was studied
- ... two rates of N were applied, or
- ... rates of 50 and 100 kg N ha<sup>-1</sup> were applied

# RUNNING HEAD or COLUMN TITLE

- abridged title
- appears at the top or bottom of each page of the printed text
- help orient the reader



# Introduction

5-10% of the total pages

- Whole idea on **why we do** a research (Back ground)→ work already done? **How our work adds importantly** to what has gone before..
- **Don't write:** several studies have shown that ..... (1-7) and several others have shown that it does not. (8-14) we report further, some of them support 1-7 & some of them are in accordance with 8-14..

# Introduction: ideally ...

- **Do write:**

Two previous studies have reported that ..... These studies were small and uncontrolled, used only crude measurements of ....., and did not follow up the patients. We report a larger, controlled study, with detailed measurements of ..... and with (x) year follow up.

- “To write an effective introduction you must **know your audience**, keep it short, tell readers why you have done the study and explain **why it is important**, convince them that **it is better** than what has gone before, and try as hard as you can to hook them in the first line”

# Introduction (cont'd)

- Hypothesis &/objective of study should be summarized & written in concrete sentences, usually at the last paragraph..
- Concise (keep it short), Clear, Logic & Systematic, yet Interesting → arresting!
- Consisting of 2 paragraphs (usually 1 page):
- **Main reasons** for doing the research (questions that need to be answered), explain it in a logical sequence, relevant with selected literature.
- A summary on **how we plan to do it** (research design) and research hypothesis, objectives, what we expect the outcome will be.

# Methods (Methodology)

## How the study was designed:

- Keep the description brief
- Say how randomisation was done
- Use names to identify parts of a study sequence
- Time & place
- Population & sample, sampling method

## How the study was carried out:

- Describe recruitment (criteria of inclusion)
- Give reasons for excluding subjects
- Consider mentioning ethical features
- Give accurate details of materials
- Give exact drug dosages
- Give exact form of treatment & accessible details of unusual apparatus

# Methods (cont'd)

## How the data was analysed:

- Use a  $p$  value to disprove the null hypothesis
- Give an estimation of the power of the study (the likelihood of a false negative— the  $\beta$  error)
- Give the exact tests used for statistical analysis

## Several designs:

- Survey: cross sectional/retrospective/prospective, sample size
- Case-control studies: inclusion method, matched or non-matched, sample size
- Cohort study: prospective, retrospective, sample size
- Clinical investigations: randomised?, blinded? Interim analysis? Sample size
- Diagnostic tests: outcome measured, sample size

# Things to watch

- Does text describe questions asked?
- What was being tested?
- How trustworthy the measurements of the variables would be?
- Were these trustworthy measurements recorded, analysed, & interpreted correctly?
- **Would a suitably qualified reader be able to repeat the experiment in the same way?**

# Modifications of standard methods

- Whenever “modifications” of published methods are used, authors should
  - Give complete details of any new methods used
  - Give the precision of the measurements undertaken
  - Use statistical analysis sensibly
- Help of a statistician needed at the planning stage of study

# RESULTS and DISCUSSION Combined

## Advantage

- simple
- only when problems are simple
- appropriate for 'note' or 'short communication'

## Disadvantage

- sometimes difficult to differentiate clearly between one's own findings and those reported in the literature
- author's argumentation cannot be developed well



# Results and Discussion as Separate Sections

- neat format
- some readers prefer to draw their own conclusions, without being prejudiced by the author, and compare them with the author's when they come to the Discussion section

When there is no separate Conclusion (and Suggestion) section

- Conclusion can be integrated in Discussion section
- Put the conclusion at the end of the corresponding paragraph

# Results

- the results are the core of the paper
- presents the data the researcher has found
- whenever practical, sets of *related* results should be organized in tables, or interpreted through figures or diagrams
- if extensive data have been collected, it is often best simply to *summarize* the results, perhaps augmenting the summary with representative examples
- the commonest fault: repetitive prose that is already clear to the reader from an examination of the tables and figures
- remember that the busy reader will be grateful for a guiding hand but should not be led as though blindfolded

# Well-presented results

- are simply and clearly stated
- report representative data rather than endlessly repetitive data
- reduce large masses of data to means, along with the standard error or standard deviation
- report repetitive data in tables and graphs, not in the text
- repeat the text only the most important findings shown in tables and graphs
- include negative data—what was *not* found—if they affect the interpretation of results. Otherwise, negative data are omitted
- give only data that relate to the subject of the paper as defined in the introduction
- refer in the text to every table and figure by number
- include only tables, figures, and graphs that are necessary, clear, and worth reproducing

# Things to watch ...

- unnecessary words. Watch especially for sentences that begin: “Table 5 shows that ...” Tables don’t show anything. Put the reference to the table in parentheses at the end.
- The reader will usually follow the results more easily if they appear in the same order as the objectives were given in the Introduction

# Example: Introduction

## Lipid peroxides as artifacts in human aorta lipids

It has been suggested [1] that lipid peroxides formed in the arterial wall are active in atherogenesis. The suggestion has been widely accepted as reasonable, since these compounds break down readily, initiating chain reactions as they do so and forming various products that are potentially toxic. For example, lipid peroxides denature serum  $\beta$ -lipoprotein [2] and attack the  $-SH$  group of proteins [3]. When vitamin E-deficient rats are fed ...

Lufton and Sowerby [1] provided some evidence for the atherogenic role of lipid peroxides. They showed that the content of peroxides in lipid extracted from the human aortic wall increased with the degree of atherosclerosis. They extracted the lipid, however, by mixing the tissue, exposed to the air, with anhydrous sodium sulfate.... These treatments may have caused the artifactual formation, by oxidation, of peroxides from unsaturated lipids during the extraction. We have, therefore, reopened the question of whether lipid peroxides occur in aorta lipids, using anaerobic extraction at much lower temperatures in order to minimize oxidation.

# Example of Results

## Lipid peroxides as artifacts in human aorta lipids

The results are shown in Tables 1 and 2. The number of values obtained for less diseased aortas is small, for the reasons given below. The peroxide values in Table 1 are all much lower than those of Lufton and Sowerby [1], which ranged from 3 (stage I) to 17 (stage V)  $\mu\text{eq/g}$ . There was no obvious correlation between peroxide content and stage of atherosclerosis.

Exposure of the tissue to air at room temperature increased the peroxide value 2-3 times (Table 2), which strongly suggests that lipid peroxides are easily formed artifactually before the lipids can be extracted. Since some exposure is inevitable during autopsy and removal of adventitia, all values in Table 1 are likely to be too high. For this reason, and because even these sensitive methods are incapable of giving an accurate result on the small amounts of lipid that can be extracted from stage 0 or I aortas, the project of comparing peroxide contents of aortas with differing degrees of atherosclerosis has been abandoned.

Table 1 Peroxide values of lipids from aortas at different stages of atherosclerosis

Stage of Atherosclerosis	No. of Aortas	Peroxide Content $\mu\text{eq/g}$
0	1	0.41
I	2	0.61, 1.75
II	4	$0.84 \pm 0.30^*$
III	16	$1.26 \pm 0.91^*$

\* Standard deviation

Table 2 Effect of lipid peroxide levels of exposing tissue to air before extraction of the lipids

Aorta No.	Stage of Atherosclerosis	Peroxide Content ( $\mu\text{eq/g}$ )	
		Extracted Immediately	Exposed*
1	I	0.61	1.81
2	II	0.81	1.64
3	III	0.80	2.62

\* For 30 min at  $25^\circ\text{C}$

# At the editor's desk ...

- the editor usually judge whether readers at this point will say “So what?”
- if they might, the author has not done an adequate job
- the Discussion is the most difficult part of any paper, and the one that editors most frequently ask to have revised



# Discussion and Conclusion Combined...

- After presenting one's findings and elaborating on their significance, a scientist is usually anxious to conclude by engaging in a certain amount of extrapolation, including suggestions for future studies

# DISCUSSION (1)

- the author explains what the results mean and their implications for future study
- does not repeat what has already been said in the review of literature or in the Results
- relates the results to the questions that were set out in the Introduction
- in organization, follow the order of the original objectives
- shows relationships between the facts observed during this investigation
- show how the results and interpretations agree, or don't agree, with previously published work
- discusses theoretical implications of the work
- states conclusions, with evidence of each
- indicates the significance of the results

# Discussion (2)

- suggest future research that is planned or is needed to follow up the results
- controversial issues should be discussed lucidly and fairly
- where results differ from previous ones, an explanation rather than refutation should be sought
- anomalous results for which no explanation is readily available should be stressed rather than concealed, and the anomalies frankly admitted
- most interesting and valuable to science will open new possibilities of exploration, and these should be brought to the fore
- speculation, if any, must be reasonable
- a single hypothesis to explain results is almost mandatory, but piling hypothesis upon hypothesis is bad

# Example of Discussion

If the peroxides measured in lipid extracts from the arterial wall are artifacts, how can we explain Lufton and Swerby's findings [1] that the peroxide content is correlated with degree of atherosclerosis? It has recently discovered [6] that arterial lipids become progressively more unsaturated with increasing degree of atherosclerosis. Among the lipid classes, cholesteryl esters show the most striking increase in unsaturation, and the proportion of cholesteryl esters relative to the other lipids also rises [9, 10]. The more atherosclerotic the aorta, therefore, the more susceptible will its lipids be to oxidation during dissection; this effectively explains the observed correlation.

# Example (continued)

Our results do not exclude the possibility that lipid peroxides play a role in atherogenesis or in the development of atherosclerosis. The small amounts found may not be entirely artifactual. Furthermore, lipid peroxides present *in vivo* may decompose between death and autopsy. More importantly, they may have formed earlier in the patients life and subsequently decomposed, with the undesirable consequences mentioned in the Introduction. **We do not believe, however, that their possible role in atherosclerosis has been or can be established by examination of the lipids after death.**

# Conclusion

- collect and summarize the most important results and their implications
- the status of the problem should be briefly reviewed before the new findings are presented
- no numbering

# Acknowledgment

- A chance to thank any institution or individual who helped significantly in the work
- A granting agency that supplied funds
- A laboratory that supplied space or materials
- A person who give advice
- Also a suitable place to recognize that a paper arises from a thesis
- If no separate place is provided  $\Rightarrow$  include in the introduction, endnote, or footnote

# Example

- Financial support from Indonesian Government by the Directorate General of Higher Education through Hibah Pekerti project (contract number xxx) is greatly acknowledged
- SSA thanks the xxx for funding, Prof. xxx for advice in the initiation of this work, and xxx for comments on the final manuscript.
- We thank xxx, PhD for identifying the plant material, and we also like to acknowledge funding support from the ... (contract number)
- This work was supported in its initial stage within the scheme of cooperation project between xxx and the Department of Physics, University of xxx, ...