SCIENTIFIC ABSTRACT

POSTED AT:
ansci.osu.edu/undergraduate/ug-research

Michelle Hendrick • Department of Animal Sciences • November 2014

Merriam-Webster: ABSTRACT

JOURNAL OF FOOD SCIENCE
FOOD ENGINEERING AND PHYSICAL PROPERTIES

Ultrasonic Velocity in Cheddar Cheese as Affected by Temperature

A. Mulet, J. Benedito, J. Bon, and C. Rossello

ABSTRACT

The ultrasonic velocity in Cheddar cheese is temperature dependent. This relationship can be used to make corrections when determining ultrasonic texture or to determine mean temperatures in cooling/heating processes. At 0 < T < 35 °C ultrasonic velocity was 1590 to 1696 m/s, at 0 and 35 °C, respectively. Differential Scanning Calorimetry thermograms linked the temperature dependence of ultrasonic velocity to fat melting. Three parts are distinguished in the curve as a consequence of the fat melting and the appearance of free oil. The most reliable temperature interval to carry out ultrasonic measurements in Cheddar cheese is identified as 0 to 17 °C.

Key Words: Cheddar cheese, DSC, fat melting, ultrasonic velocity

INTRODUCTION

ULTRASONIC TECHNIQUES HAVE BEEN USED IN MEDICINE (Wells, 1977), metal testing (Papadakis, 1976), and recently in the food industry. Ultrasonics provide a non-destructive, rapid, automated, and low cost technique for quality evaluation (Povey and McClements, 1988).

Ultrasonic techniques have been used in the beef industry to quantitatively determine carcass value and predict heritable muscling and quality attributes (Miles et al., 1990; Whittaker et al., 1992; Cross and Belk, 1994). Velocity, attenuation, and frequency spectrum composition are the commonly measured acoustical parameters (Povey and McClements, 1988; Povey, 1989, 1998). The frequency spectrum composition has been used to detect hollow hearts in potatoes (Cheng and Haugh, 1994) and intramuscular fat (Whittaker et al., 1992). Ultrasound velocity measurement has been carried out to determine meat quality (Cross and Belk, 1994); to estimate the solid/liquid ratio in fats, oils, and adipose tissue changes occur. Differential Scanning Calorimetry (DSC) studies showed that dried cheese underwent a phase transition from about –30 to 38 °C, primarily due to changes in fat crystallinity (Tunick, 1994).

Cooling of Cheddar cheese blocks is the primary means of controlling microbial activity to promote homofermentative metabolism (Fryer, 1982). Cooling rate is a very important factor affecting flavor development during aging (Miah et al., 1974; Grazier et al., 1993). A non-invasive method for monitoring internal temperature would be advantageous.

Ultrasonic temperature determinations are performed by measuring ultrasonic velocity through a material at different temperatures and establishing a temperature-velocity relationship (Lynnworth, 1992). The study of the temperature-velocity relationship has been used to determine the composition of food products, such as fish (Ghaedian et al., 1998).

Our objective was to quantify the relationship between ultrasonic velocity and sample temperature in Cheddar cheese. This relationship was tested by using an unsteady heating experiment to determine the accuracy of the procedure.

MATERIALS & METHODS

Raw material

Cheddar cheese (Kerrygold, Irish Dairy Board, Dublin, Ireland) purchased from a local supermarket was used. The cheese was kept refrigerated at 1 °C in a sealed plastic bag to avoid water loss, and all tests were performed within 7 d of purchase.

Proximate analysis of cheese

Protein was determined by a Kjeldahl method (Method 991.22. AOAC. 1996), fat by solvent extraction (Method 933.05. AOAC. 1996), ash by overnight heating at 550 °C (Method. 935.42. AOAC. 1995), and moisture by oven drying (Method. 24003. AOAC. 1984)

: a brief written statement of the main points or facts in a longer report, speech, etc.

ABSTRACT

noun : A smaller quantity containing the virtue or power of a greater.

Samuel Johnson.
A Dictionary of the English Language. 1755.

"To attract readers and entice them to read an entire paper, authors need to adopt the art of persuasion—convincing a reader of the worth of reading the paper and perhaps subsequently of using and citing it. The first step in this type of persuasion is to select a title for the paper that is inviting and not off-putting. Next comes the abstract, in which the author should speak in part to the value of the study and its importance. In essence, the author tries to encourage readers not to abandon the paper but to read on. The first sentence sets the stage and requires good (effective) writing to draw in the reader (who in some cases will be a peer reviewer). The abstract highlights the problem and discusses why readers should care about it. It also reviews the procedures, major findings, recommendations, and conclusions. The abstract might conclude with a few sentences about the value of the study. A good abstract may be the only opportunity to attract readers. For this reason, it is not an afterthought; time should go into its development and presentation."

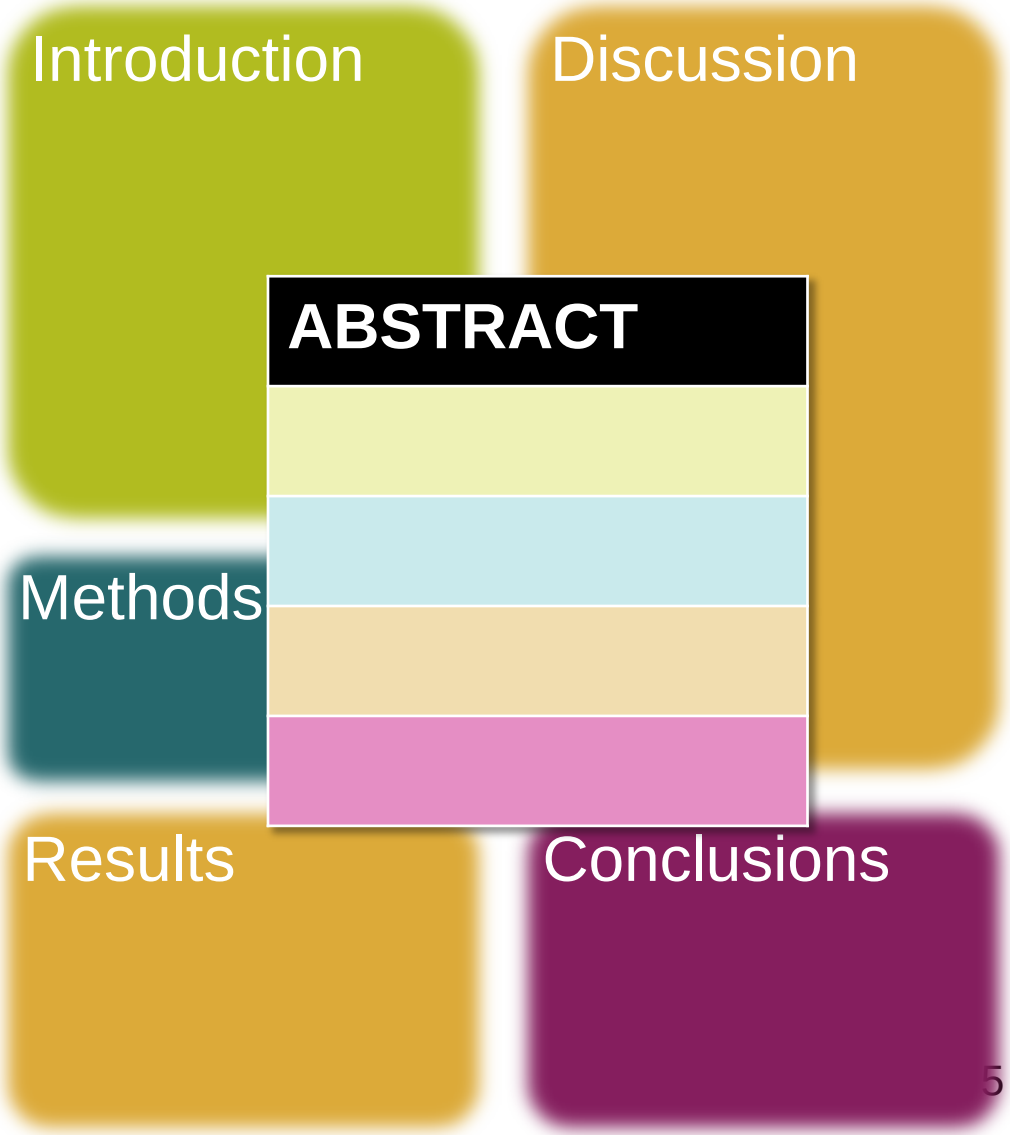
P. Hernon, C. Schwartz. 2010. Editorial. *Library & Information Science Research*. 32:3 173.

Research

Identify problem
Gather info
Form hypothesis
Test hypothesis
Analyze data
Form conclusions

=

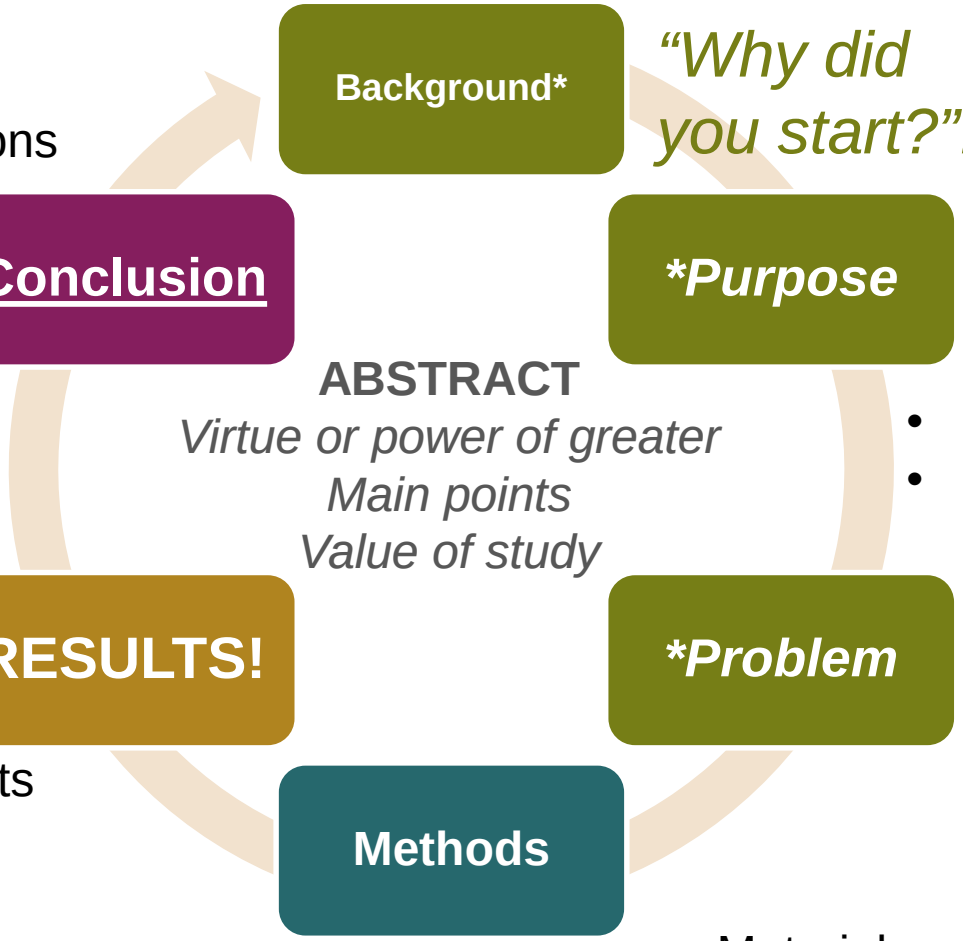
Paper • Poster • Presentation



CFAES	Denman
Introduction or Background	-General background information -Facts about the topic -Statement of the problem -Statement of the purpose
Methods	Methods
Results	-Results -Discussion
Conclusions	Conclusion/ importance

cfaes.osu.edu/students/academics/undergraduate/research/cfaes-undergraduate-research-forum

denman.osu.edu/abstracts.aspx



- Importance
- Future directions

"What does it mean?"

"Why did you start?":

- Where we are at
- What we know and do not know

"What did you find?"

- Analysis results
- Findings
- Discussion

"What did you do?"

- Materials
- Experiments
- Analyses

"By the year 2050, the world's population is expected to reach 9 billion people."

"Livestock production is an important contributor to sustainable food security for many nations, particularly in low-income areas and marginal habitats that are unsuitable for crop production."

Olivia F. Godber and Richard Wall. Livestock and food security: vulnerability to population growth and climate change. 2014. *Global Change Biology*. 20:10 3092–3102.

Help with all sorts of writing questions

- OSU Center for the Study and Teaching of Writing – Writing Resources
  - cstw.osu.edu/writing-center/resources

How to write an abstract

- Chittaranjan Andrade, "How to write a good abstract for a scientific paper or conference presentation"
  - http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3136027/

Help with choosing verbs

- Dena Bain Taylor, "A Guide To Verb Tense Voice And Mood In Scientific Writing." University of Toronto
  - hswriting.library.utoronto.ca/index.php/hswriting/article/view/3340

Help to clarify and shorten your writing

- "30 Problem Words and Phrases"
  - www.dailywritingtips.com/30-problem-words-and-phrases/
- "50 Plain-Language Substitutions for Wordy Phrases"
  - www.dailywritingtips.com/50-plain-language-substitutions-for-wordy-phrases/
- "Nominalizations" – Claremont Graduate University
  - www.cgu.edu/PDFFiles/Writing%20Center/Writing%20Center%20Resources/Nominalizations.pdf

Help to produce effective writing

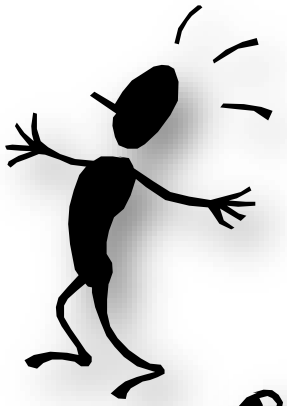
- "The Science of Scientific Writing," by George Gopen and Judith Swan
  - www.americanscientist.org/issues/feature/the-science-of-scientific-writing

Help with writing in general

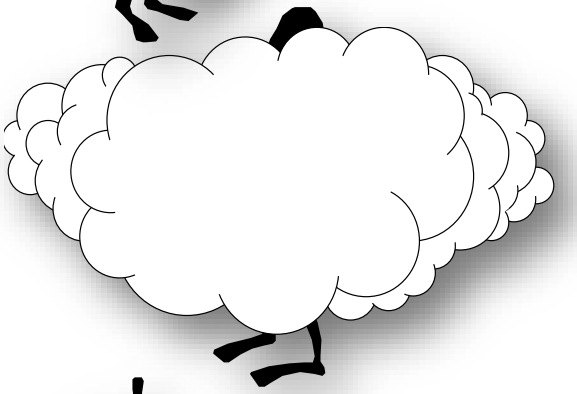
- Writing in College: A Short Guide to College Writing," by Joseph M. Williams and Lawrence McEnerney
  - writing-program.uchicago.edu/resources/collegewriting/

COMMON PITFALLS…reviewer comments

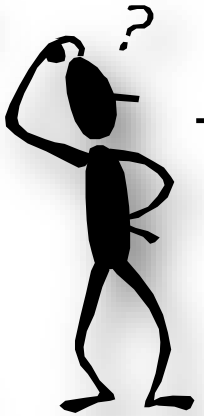
Too much detail, e.g., methods, background, etc.



Too general

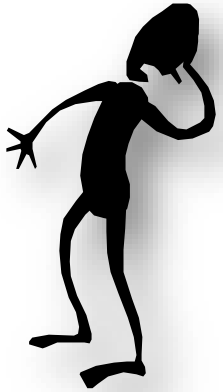


Use of too many undefined terms, e.g., huge, dramatic, significant, etc.



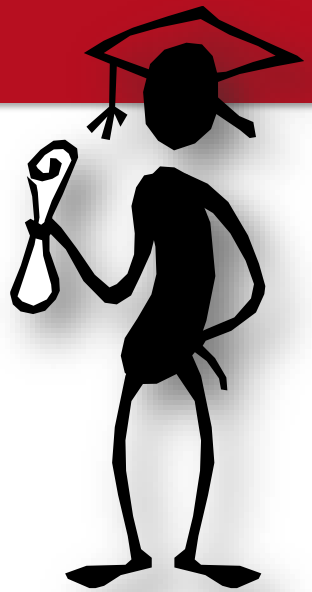
Typos

Does not meet requirements, e.g., word count, format, voice, etc.

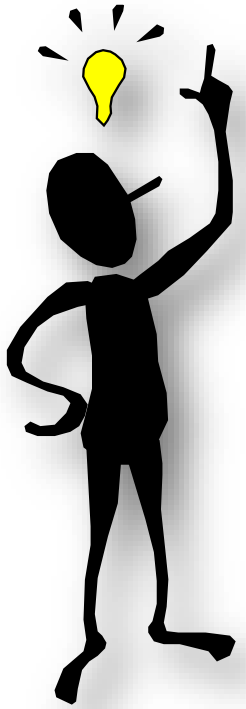


Jargon, difficult terminology, too technical

Key words

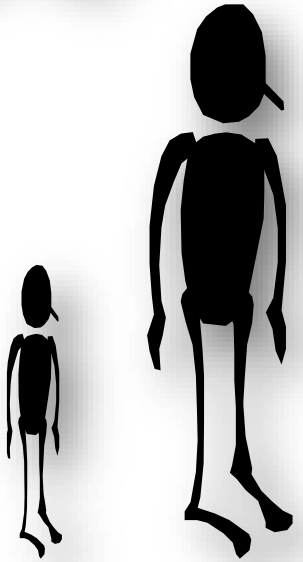


Formal writing



No new info

No citations



Representative