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# TEACHING ARGUMENTATION AND INQUIRY THROUGH CULINARY CLAIMS

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Handbook of Molecular Gastronomy  
Launch event 12 May 2021

# CHALLENGES IN EDUCATION

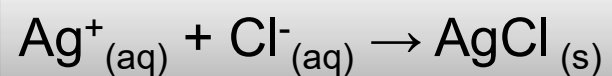
- Perceived relevance of education, knowledge transferability
  - Learning that makes a difference to the learner
- Authentic inquiry and experimentation
  - Not only ready-made, known-answer activities
- Education that includes argumentation, reasoning, discourse and ways of thinking



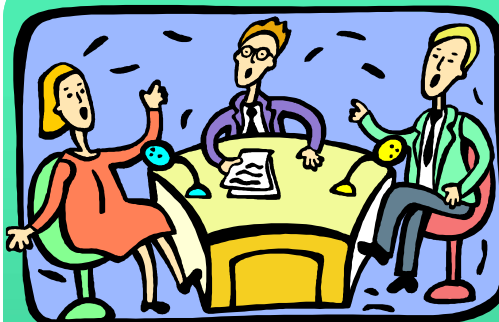
# SCIENCE EDUCATION IN SOCIETY



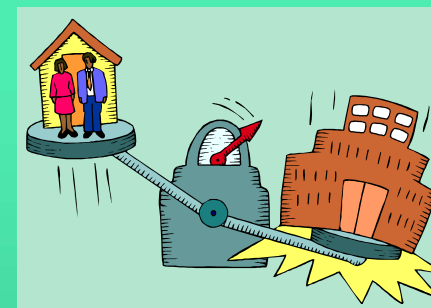
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Experiment &  
inquiry



Reasons &  
argumentation



Socioscientific  
issues



Adapted from Roberts & Gott (2010). Questioning the evidence for a claim in a socio-scientific issue: an aspect of scientific literacy. *Re. Sci. Tech. Educ.*, 28(3), 203-226.

# THE “KITCHEN STORIES” CONCEPT

## IN SCIENCE & HOME ECONOMICS EDUCATION



1. Students collect culinary claims (culinary precisions)
  - “You can’t make jelly with fresh kiwi because it will not set”
  - “Using a beer glass for milk will ruin the utility of the glass for beer”
  - “Apples go brown more slowly if cut with a ceramic knife”
2. Analyse the kitchen stories
  - Which reasoning could lie behind this claim?
  - Can it be tested?
3. Collect 1<sup>st</sup> hand and 2<sup>nd</sup> hand evidence
  - Research literature
  - Test the claim experimentally (and publish)

**FOOD & COOKING CONTEXT**

**ARGUMENTATION**

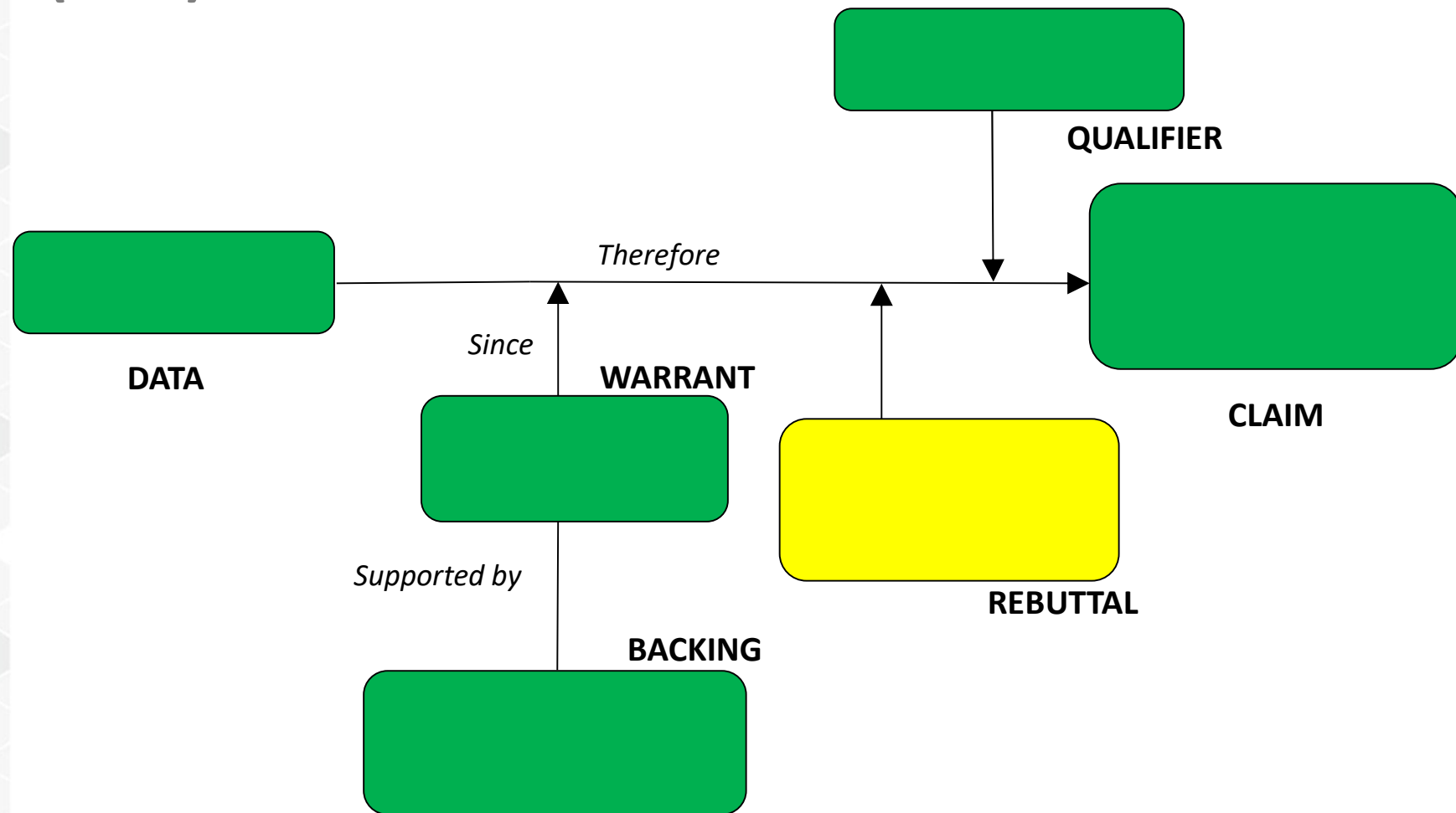
**ARGUMENTATION  
SOURCE CREDIBILITY  
INQUIRY**

E.g., This (2005). Modelling dishes and exploring culinary precisions: The two issues of molecular gastronomy.  
*Brit. J. Nutr.*, 93, S139–S146

# TOULMIN'S ARGUMENTATION PATTERN (TAP)



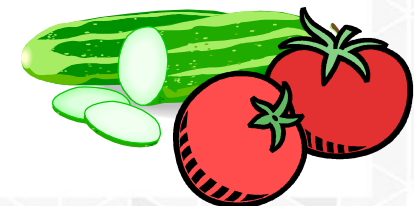
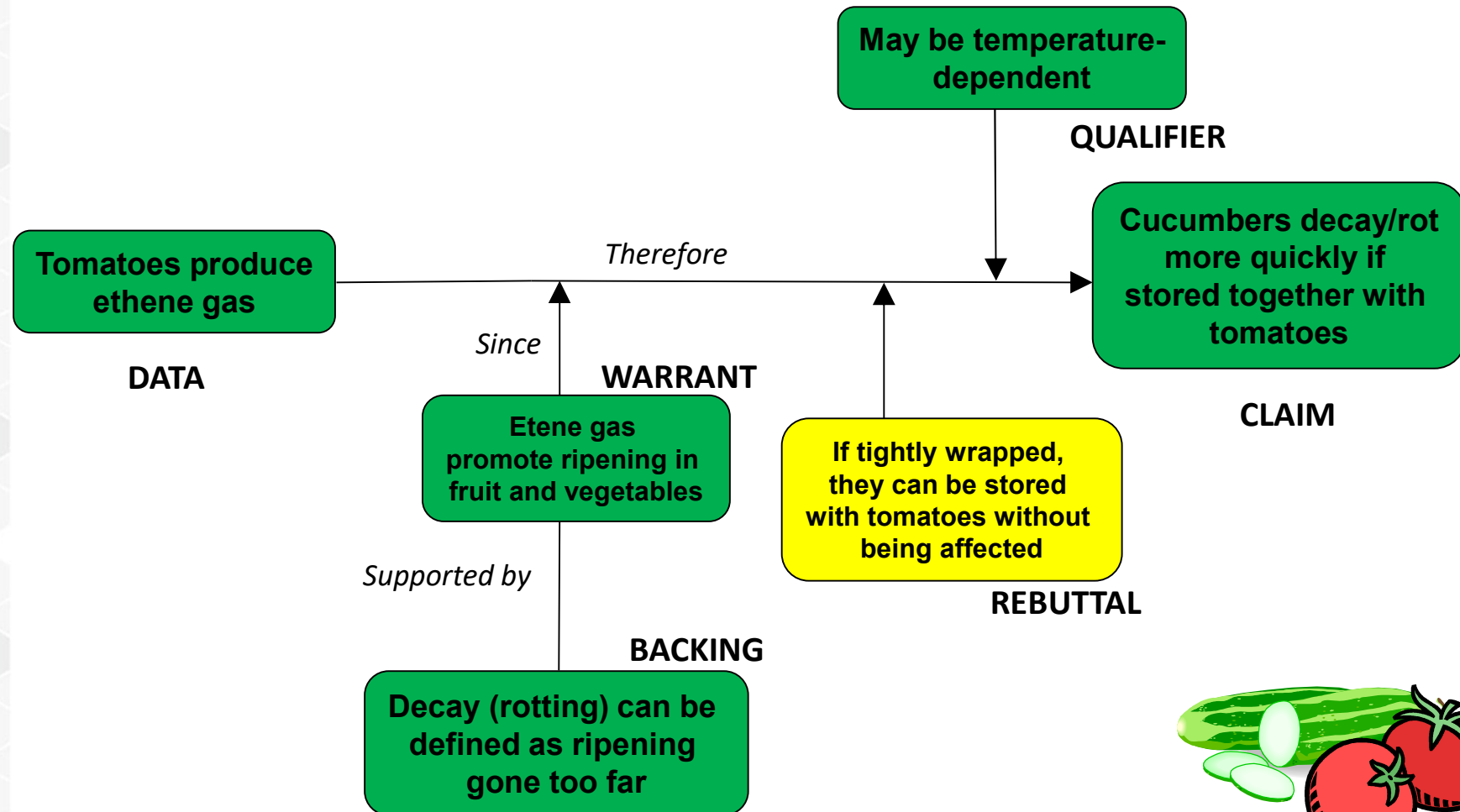
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# TAP APPLIED ON A CULINARY CLAIM



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# PHASE 1

## CLAIM ANALYSIS & ARGUMENTATION

1. Groups collect kitchen stories (KS)
  - Select suitable candidates (researchable issue)
2. Analyse according to TAP
3. Group-to-group peer review process
4. Revision and submission to educator
  - Supervision along the way important, still many issues being open-ended

No  
experiment  
yet

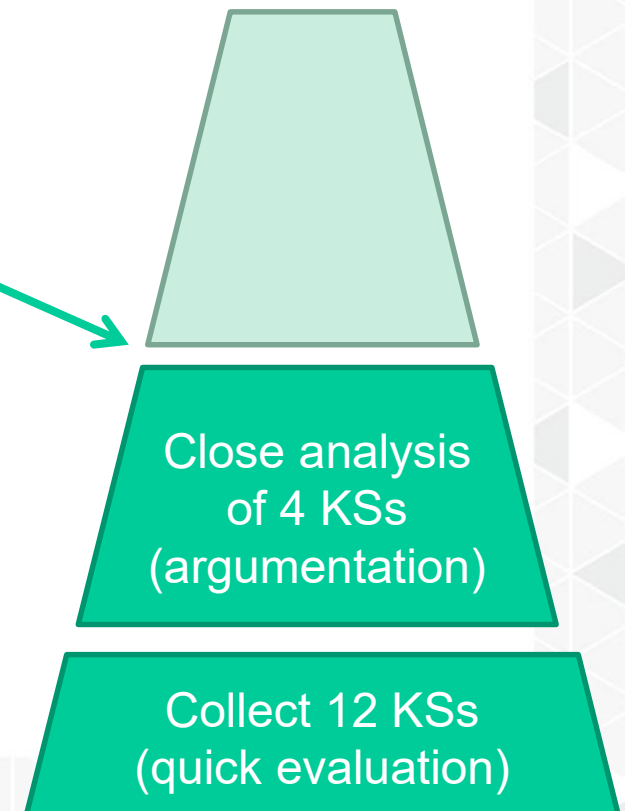
Close analysis  
of 4 KSs  
(argumentation)

Collect 12 KSs  
(quick evaluation)

# PHASE 2

## SOURCE EVALUATION & EXPERIMENT

1. Source awareness
  - Judgement of credibility & trustworthiness of information sources





# SOURCE AWARENESS / CREDIBILITY JUDGEMENT

TY

## Rating Scale for scientific level

The following scale is proposed for the assessment of academic/scientific level

Dimension 1: Scientific level/credibility					
1	2	3	4	5	6
Internet with no other references Old wives' tales 'Friends and relatives'	Experienced person	School book (primary/secondary school) <u>Experienced</u> person Professional <u>Cookbook</u>	School book (primary/secondary school) University college book Specialist literature Professional Cookbook	University/university college book Specialist literature Professional	Scientific literature on international level (books or articles)

Rating scale for evaluating scientific credibility

## Rating Scale for craftsmanship credibility

Not all information may have scientific evidence, and some disciplines (including cooking) carry much valuable experience-based (tacit, action-borne) knowledge. Occasionally such knowledge is essential for someone to be able to conduct an experiment or cook a dish in a consistent manner. This is the reason for having a separate scale for craftsmanship credibility

Dimension 2: Credibility in terms of experience (craftsmanship)					
A	B	C	D	E	F
A is the lowest level (novice) whereas F is the highest. Examples may be persons having long experience in craftsmanship, cooks/chefs, various types of cookbooks (may well span more than one level) etc.					

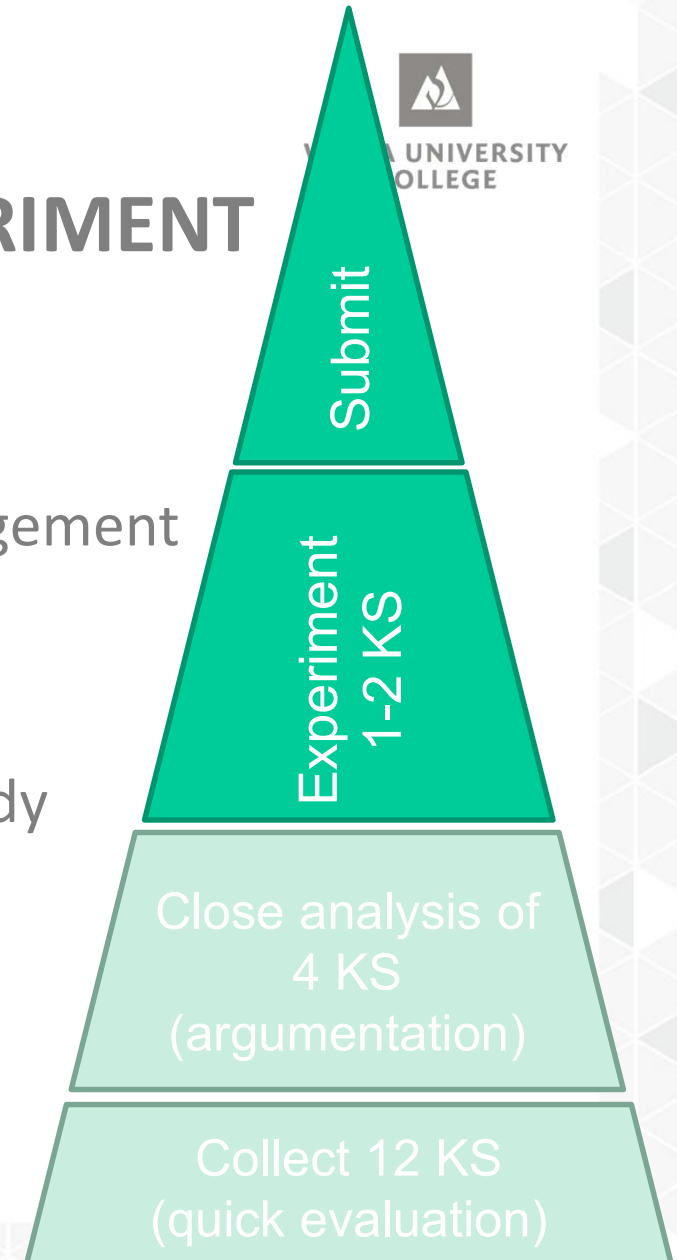
Rating Scale for craftsmanship credibility

An experienced cook/chef may have relatively low credibility along the scientific dimension (e.g. level 2) but high credibility along the craftsmanship dimension (e.g. level 4 or 5). The same may apply to an artisan that produces dried fish, cheese or some other product and has extensive practical experience with the food (action-borne or tacit knowledge).

# PHASE 2

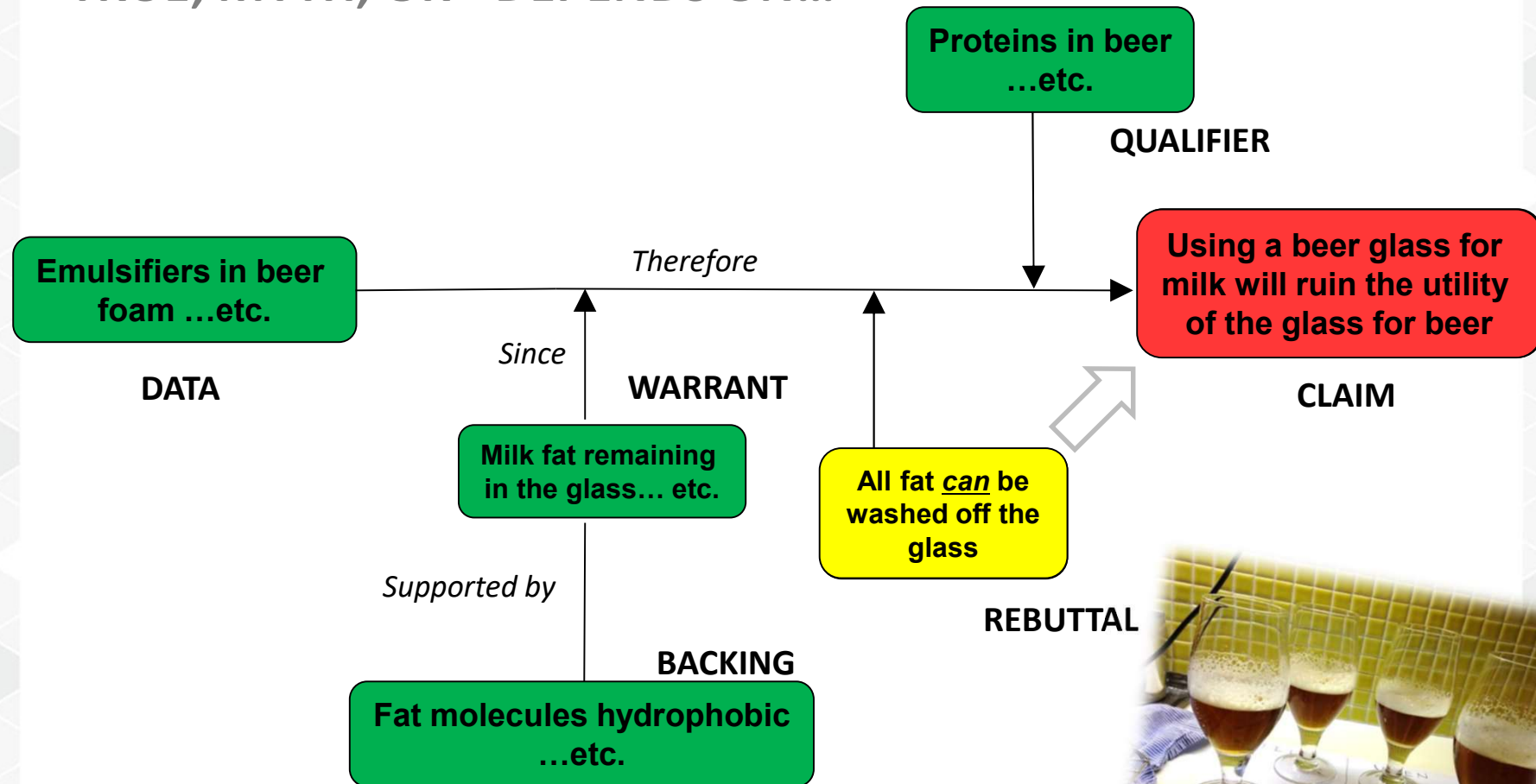
## SOURCE EVALUATION & EXPERIMENT

1. Source awareness
  - Credibility & trustworthiness judgement
2. Experiment planning & design
  - Credibility judgement of own study
3. Revision and submission



# TAP APPLIED ON A CULINARY CLAIM

## TRUE, MYTH, OR «DEPENDS ON...»



# OPEN INQUIRY & AUTHENTIC ARGUMENTATION



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Inquiry Argumentation  
Declarative/fact knowledge  
Culinary practices & heritage  
Nature of science



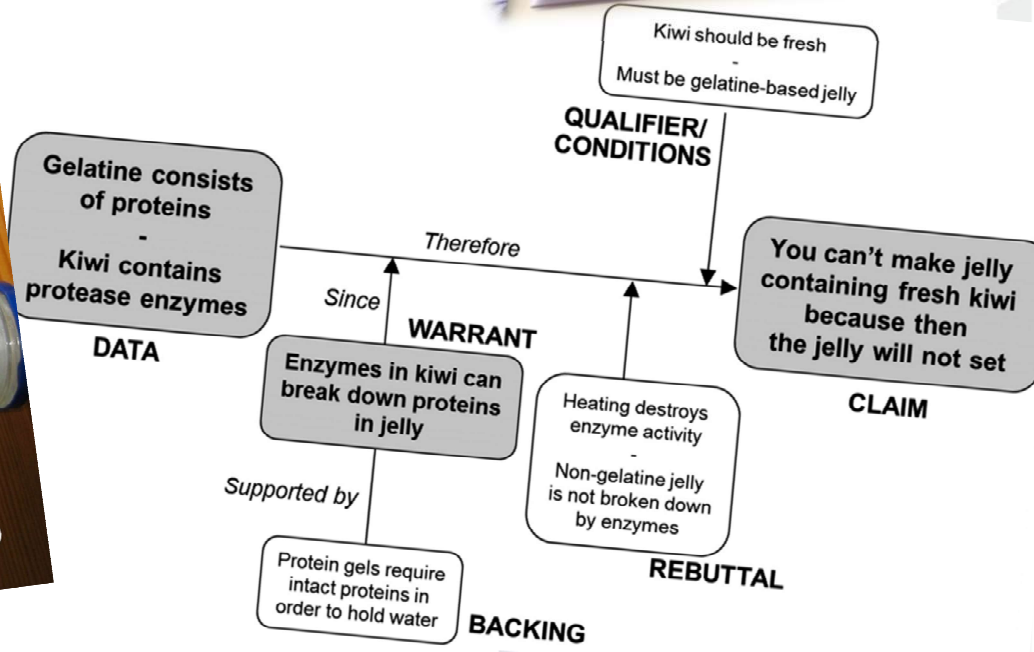




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# THANK YOU



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