

PPIC Technical Committee Meeting

March 23rd, 2021 12:30pm – 2:00pm CST

Present:

B. Pam Ismail (PPIC)
Karthik Pandalaneni (PPIC)
Adiella Abelseth (PPIC)
Adam Janczuk (IFF)
Gabriela Perez-Hernandez (Kellogg's)
Gary Reineccius (UMN)
Julie Anne Grover (Kraft Heinz)
Lehan Patrick (Saputo)
Lolly Occhino (AURI)
Sara Rosene (GMI)
Seyhun Gemili (ADM)
Steve Hess (Hershey's)
Wajira Ratnayake (Ingredion)
Yui Maneephan Keeratiurai (Danone)

MEETING MINUTES

Meeting Focus: Reevaluate Research Priorities

Introduction to Focus:

- PPIC wants to put out another request for proposals (3rd for PPIC)
- 6 Current Research Priorities established a little over 2 years ago, now is the time to revisit with new members on the committee
- To clarify: Priorities Areas (i.e. focus areas) are more specific and related to the 6 overarching current Research Priorities, just deeper focus.
- Committee was emailed before the meeting and asked to ranked top 6 Current Research Priorities and Priority Areas, which then Pam summarized.
- The question was what new priorities we need to add and which ones we want to remove or edit
- Other Research Priorities are listed on the [PPIC Website](#) and can be revisited, or new ones suggested (ex. Fermentation)

Open to the committee comments:

1. Screen, identify, characterize, and enhance the flavor, functionality, and nutrition of novel plant proteins as impacted by various extraction and processing conditions in comparison to common protein ingredients (ranked #3)

Gabriella: Combine or modify; flavor is found in multiple researches

Pam: When working with plant proteins one main challenge is the flavor; we want to mitigate that without losing texture properties

Adam suggested keeping two challenges separate

Approach innovation, different flavor challenges (good vs. bad etc)
Formulating, adding flavor, flavor binds with protein, flavor lost later vs. off
flavor

Lolly: Research 1 seems like a catch all; is it just summarizing everything, then maybe
it's not needed.

Pam: Research 1 & 3 perhaps could be combined or remove "extraction" from 1.

Julie Anne: Research 1 key word is "Novel"; fully characterize novel plant proteins that
we may not be familiar with yet.

Pam: Prefer not to remove (perhaps just reword) research 1 because it is such a catch all
that if we remove it we would have to have multiple specific research priorities.

Adam suggested instead of just novel, we could focus on emerging plant proteins

Pam suggested to remove "and enhance" because we need to understand them before we
enhance them. Yet if we remove "Enhance" none of the Current Research talks
about functionalization.

Priority one was agreed to be modified as such:

Screen, identify, characterize, the flavor, functionality, and nutrition of emerging plant proteins
as impacted by various extraction and processing conditions in comparison to common protein
ingredients

2. Determine flavor and protein interactions in various protein sources and in different food
systems (ranked #2)

This Research Priority was left as is

3. Investigate novel protein extraction techniques that are solvent free and can be labeled as
organic (while looking at flavor, nutrition and functionality) (ranked #4)

Pam: Can we remove this Research Priority completely? Research 1 talks about
extraction, maybe 3 is encompassed in 1.

Adam: It concerns consumer labeling; market position, not overall technical challenge;
less priority than the others

Seyhun: Hexane- technical issue, clean, solvent free, the process does have challenges.

Wajira: Perhaps concern of how it's worded.

Gabriela: Reword to focus more on sustainability; less processed proteins have better
LCAs; it could be combined with 1

Pam: Rewording 1 to eliminate 3 by adding sustainable and feasible.

Wajira: 1 is about novel emerging protein and extracting them, not interested in all other
minor extraction processes which 3 is addressing.

Lolly: Keep 3 because it can focus on other not novel proteins

Adam: Responsible processing technique to improve flavor profile, but takes away the labeling claim/ consumer benefit to a process that is solvent free, minimal environmental impact/ better footprint

Seyhun: Functional proteins or better tasting proteins

Gabriela: More focus on upcycling; like extracting proteins from waste streams.
Remove solvent to cleaner

Adam: Less environmental impact is the modern goal to move away from hexane or petrol based products.

Gabriela: There are other processes that include solvent that may be better than hexane

Pam: Techniques that have less environmental impact and remove solvent free?

Seyhun: Investigate clean and minimal plant protein processing techniques with less environmental impact

Priority three was agreed to be modified as such:

Investigate cleaner plant protein processing techniques that are solvent free with less environmental impact, while preserving or improving functionality and quality

4. Identify ways to mitigate off flavors while maintaining textural properties (ranked #1)

This Research Priority was left as is

5. Investigate potential in nutritional value and functionality via blending of plant proteins (ranked #5)

Pam suggested that blending is still important and we haven't had one project yet on blending. Companies are blending but not in an optimized manner to enhance nutritional and functional.

Julie Anne supports blending as long as it's just plant proteins, not blending with animal proteins

Lolly suggested that the nutritional value is important focus

Gabriela suggested a focus on digestibility

Adam: Is this to create a system that has an optimized nutritional value? What problem is this solving for consumers? Where is the consumer looking at this; where is the opportunity to have a greater social impact?

Pam: a) Blend proteins to enhance nutritional properties

b) Goals for sustainability: sustainable crops, these proteins may not be as functional but you want them there, so you blend with a more functional protein to get texture and nutrition and label with sustainable ingredients

Seyhun suggested "Blending of plants ingredients" instead of protein to add fiber etc

Pam: But the focus is protein

Gabriela: Is this to get to PDCAAS of 1.0 by blending protein?

Pam: Not necessarily PDCAAS 1.0 but increase the PDCAAS;

Seyhun suggested that blending to increase nutritional value isn't for PPIC because it's not technical or challenging enough

Pam: Blending for functionality is important while maintaining nutritional value

Gabriela: Challenge is the digestibility: how can we improve digestibility. What else comes with the protein, like fiber. Can we make it broader?

Adam suggests adding "or improving"

Priority five was agreed to be modified as such:

Investigate potential increases in functionality via blending of plant proteins, while maintaining or improving nutritional quality

6. Breed to enhance protein quality (ranked #6)

Traditionally breeding has only been focused on yield but there are a lot of novel or emerging sources where breeding can enhance potential: nutritional, functional, remove potential compounds that could result in off flavor metabolites

Gary: Is it possible to breed to enhance quality?

Pam: Yes, we have a couple projects on that, what we're doing is looking at different varietal lines to see differences in protein profile and composition and then cross breed, selective breeding for certain protein profile rather than just protein quantity.

Adam: Is this agriculture biotechnology? To avoid genetic modification or bio engineering. Selective breeding consumers can relate to.

Gary: Suggests to Define quality: functionality, nutrition, and flavor

Wajira: Is this a protein related effort of a horticulture type effort. Obtaining the product to characterize to verify what they did or to provide guidance for the breeder to develop the crop

Pam: Providing guidance; wet chemistry of the different lines and feeding it to the breeders telling them these lines have the profile of proteins that are more functional; and phenotyping for them

Wajira: Word it in such a way to capture the contributions for protein work, otherwise it seems to be horticulture and plant breeding part

Pam: Word it to show protein characterization will lead to enhanced protein crops
Breeding from timeline perspective; The purpose is what can we do as protein scientists to feed the breeding program.

Seyhun: Is there a way to look at the timeline of breeding

Wajira: Crispr line technologies involved also?

Pam: Natural selective breeding. We do have one PPIC funded project on breeding: Pennycress by David Marks

Gary: Invite someone with breeding background to explain this work to the group

Priority five was agreed to be modified as such:

Enhance protein functionality, nutrition and flavor through agricultural technology

Priority Focus areas updated in 2020 for the 2nd round of RFP

- Priority areas are more specific, and are related to the identified research priorities
 - Look at previous priorities and decide to eliminate or prioritize new suggestions
 - Priority Areas (Focus Areas) allow request for proposals to be narrowed down to receive proposals based on what we're interested in
1. Exploring protein functionalization approaches and processing technologies to utilize plant proteins in ~~trendy~~ and high-value applications (e.g. meat alternatives, dairy alternatives, high protein beverages, bars, snacks, encapsulation)
 - Pam: what I hear from companies is that this remains valid
 - Sara: Protein drinks are pretty common, perhaps we should focus on pastas, or bars (sweet) where off flavors tend to stand out.
 - Gabriela: perhaps using snacks. Do bars go under snacks?
 - Encapsulation is an intermediary step, not a final product.
 2. Characterization of protein functional properties, flavor profile, nutritional quality as impacted by varietal differences and growing conditions
 3. Characterization of structure and function relationship of novel plant proteins and/or their nutritional quality as impacted by various extraction and processing protocols
 - Seyhun: This seems to broad
 - These two seem similar, so what do we want to replace it with. An interest area

Further Clarification on Focus Points

Pam clarifies: Focus Areas are more specific

Gabriela: The Focus Areas need to align with the current research?

Pam: Focus is to choose what we would like to focus on: legumes, cereal, optimization of extraction, fermentation? Would you like me to take some of the new suggestions combine them, eliminate redundancy and send a suggested list of Focus Areas?

Julie Anne: Considering there was some confusion about the Priority Areas, perhaps the Priority Areas should be matched with the current Research Priorities (perhaps as drops down selections) to vote on.

Pam: We could, but we want to limit to a few Focus Areas, as we might not be able to cover everything in one round of proposals

Julie Anne: Perhaps it is best to identify research focuses that will fall under the current research priorities, and then we can determine what we can add

Pam: We don't have the funding to fund each project, we give researchers options of what we are interested in, and perhaps we get 2 topics we're interested in.

Lolly: Couldn't the RFP be based on the 6 Research Priorities, but with a specific focus (ex.-cereal) rather than having to rewrite everything.

Gabriela: Why do we want to eliminate? Can we make the 6 Research Priorities our RFP?

Pam: Without focus areas we will receive very broad proposals. The 6 Research Priorities are broad. What kind of projects do the tech committee want to see? Focus Areas narrow down the choices.

Pam will suggest some Focus Areas from the input and send it in an email and then committee members can provide suggestions. This will make it easier and avoid confusion between Research Priorities vs Focus Areas.

Each Research Priority can have a focus on: type of processing, type of application, or type of protein. We want to make sure that the committee receives proposals of interest. For example is the committee interested in seeing: work on camelina, cereals, application driven type of work, molecular type of work?

Pam will stream line the Focus Areas, and send a document with explanation to help finalize them.

Lolly: Tie back the Focus Areas to the Research Priorities.

Pam: The Focus Areas don't need to address all of the current Research Priorities for this round of RFP, there will be other RFPs in the future that can address the remaining Research Priorities.

Other Questions/Comments:

Julie Anne: Could you send a list of completed projects and those which are in progress?

Pam shows where they can be found on the website

Julie Anne: the new project won't replace the current projects?

Pam: No, these are just individual projects that are one-year in length.

Action Items

- Members with ideas for Focus Areas that you'd like to bring up, please email Pam
- Pam will follow up with suggested Focus Areas based on input from the committee, and provide explanations
- Focus Areas will be finalized, and third round of RFP will be developed and sent out to PPIC researchers