IFPRI Brief Template

Check One: ☒ **Project**   ☐ **Review**   ☐ **Collaboration**
                 ☐ **Workshop**   ☐ **Other**

Descriptive Title	Improving the ability to quickly determine the long-term stability of formulated suspensions by accelerating ageing effects.
Working Title[1]	Method for accelerating the ageing of dispersions.
Technical Area[2]	Wet Systems
Date	14 June 2022
Short Description	Product performance in the supply chain is critical and accelerated testing is used to induce failure. Temperature and centrifugation are often used but to determine shelf-life, in many cases (beyond chemical stability) the failure modes are known not to be Arrhenius in nature. Biological systems may not even allow for the standard accelerated testing. We hypothesize that particle network changes are fundamental to many failure modes, either formation of a network or weakening/collapse of the network. Types of system of interest would include: flocculation of suspensions designed for long-term colloidal stability, serum formation or collapse of weakly flocculated gel networks. Examples could include: protein/lipid nanoparticle suspensions, depletion flocculated suspensions or emulsions. These could be model systems or provided by the IFPRI members. Seeking to accelerate 100-fold for these predictions.
Objectives	• Measurement of the local structure with time. • Matching of the mechanism of colloidal forces responsible for stability to the alternative accelerated ageing test or tests • Identification of alternative methods which predict long-term stability of suspensions • Optionally identification of any method applicable to sensitive biological systems.
Scope	Colloidal Dispersions or Emulsions Acceleration of a well-understood model system is acceptable OoS: Dry products, Chemical Instability, Crystal Growth, Ostwald ripening.

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[1] Title used in meeting agendas and file archives
[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

Recommended Contractors (2 or 3)		
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