

Utah State University

DigitalCommons@USU

[Research on Capitol Hill](#)

[Browse Undergraduate Research Events](#)

1-25-2023

Grinding Cocoa Changes Chocolate Properties

Joseph Cooney
Utah State University

Follow this and additional works at: <https://digitalcommons.usu.edu/roch>



Part of the [Physics Commons](#)

Recommended Citation

Cooney, Joseph, "Grinding Cocoa Changes Chocolate Properties" (2023). *Research on Capitol Hill*. Paper 131.

<https://digitalcommons.usu.edu/roch/131>

This Poster is brought to you for free and open access by the Browse Undergraduate Research Events at DigitalCommons@USU. It has been accepted for inclusion in Research on Capitol Hill by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



Honduran chocolate differs from other dark chocolates.



Joseph Cooney
Utah State University

Silvana Martini, PhD
Utah State University

Commercial chocolate prioritizes consistency over quality.

Most commercial chocolate is made from beans from multiple sources. Usually, this sacrifices uniqueness in flavor and texture for better product consistency.

This research helps to identify the unique properties of chocolate from each of these sources.



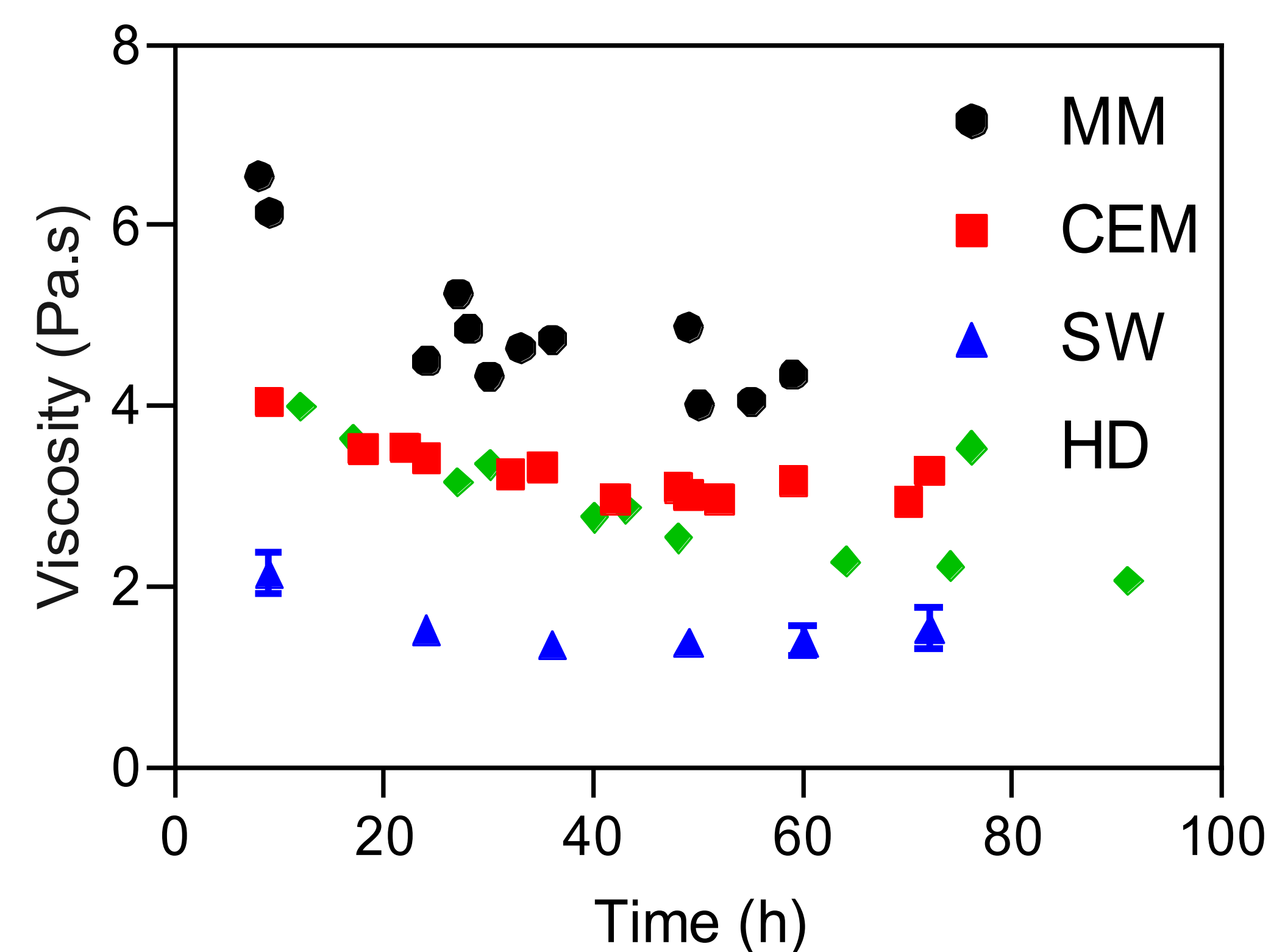
Credit: Aggie Chocolate Factory

Testing chocolate properties

We test the viscoelastic properties as a function of grinding time of single-origin chocolates made by the Aggie Chocolate Factory. Using rheology, we measure their viscosity and shear stress. We measure each sample's particle sizes using a particle size analyzer. Swiss, Honduras, Costa Esmeraldas Milk, and Maya Mountain chocolates are presented.

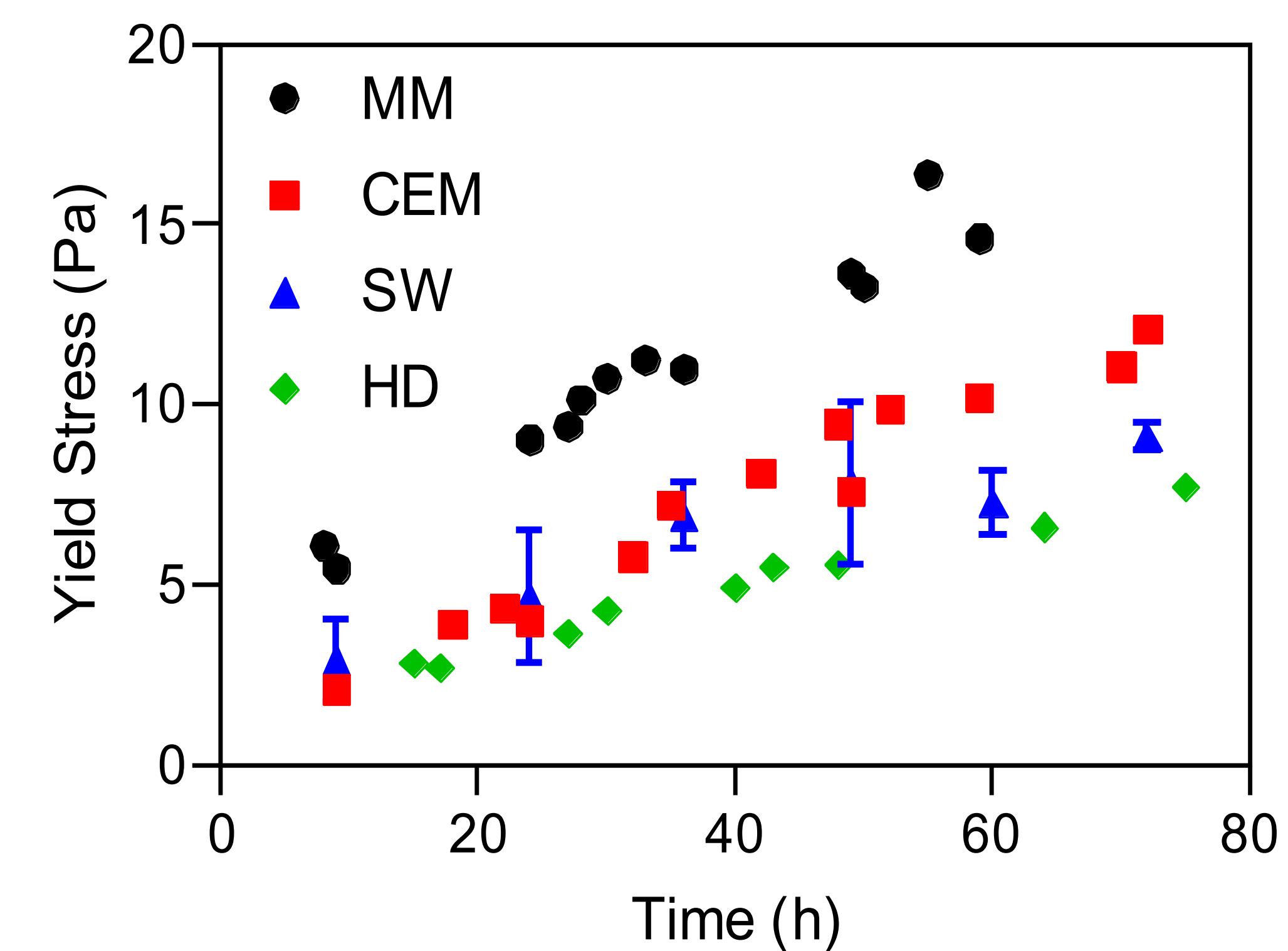
Grinding cocoa changes chocolate properties.

Viscosity Of Chocolates



Dark, milk, and milk sweet chocolates have different viscosity and yield stress depending on their origin and type.

Yield Stress Of Chocolates



Honduran chocolate, which is dark, has much lower viscosity and yield stress than other dark chocolates.

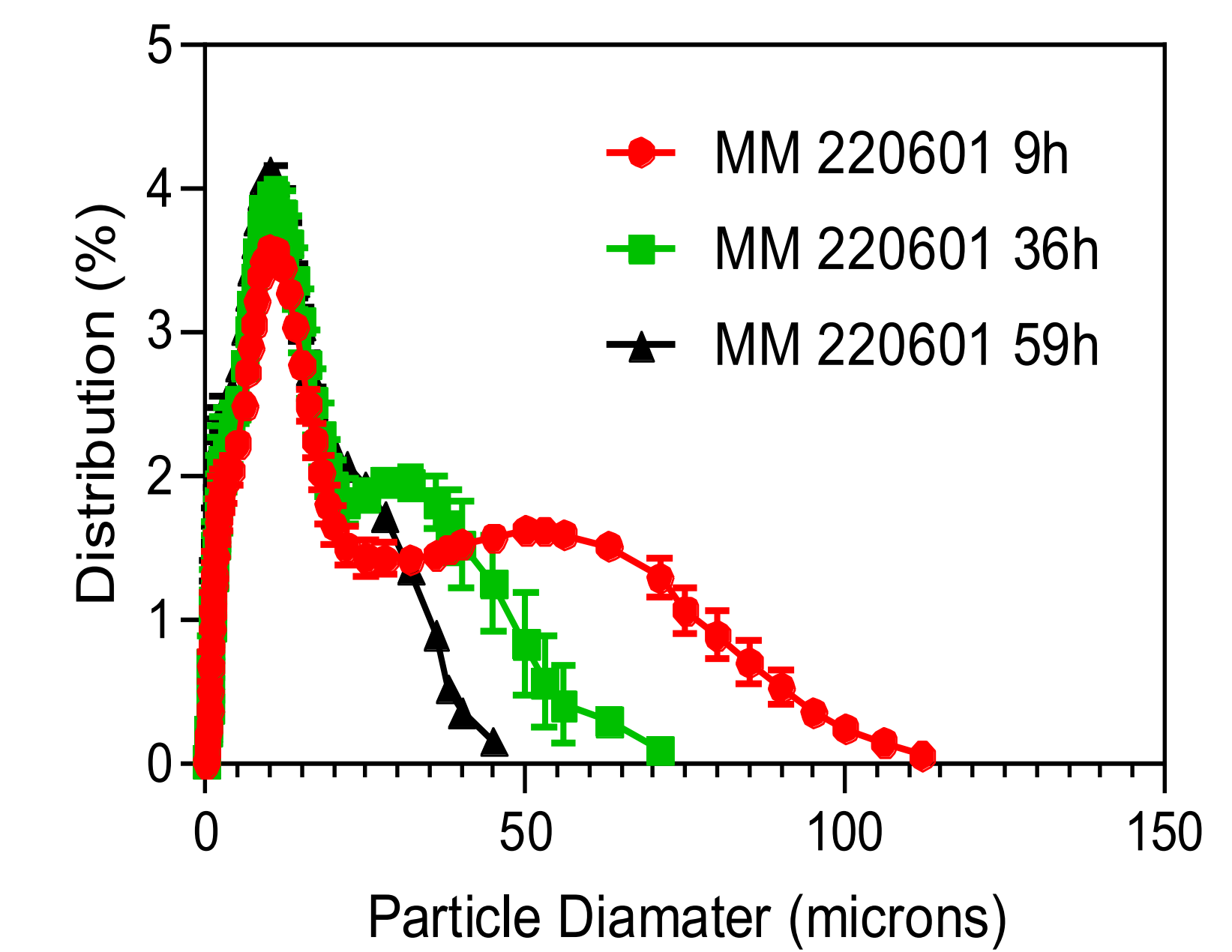
Honduran chocolate is unique, but maybe not better.

Single-origin chocolates' viscoelastic profiles are consistent with known multi-origin chocolates' profiles.

- Milk chocolate has lowest viscosity.
- Dark chocolate has highest viscosity and yield stress.
- Particle size is related to viscosity, yield stress.
- Honduras chocolate is unique from other dark chocolates.

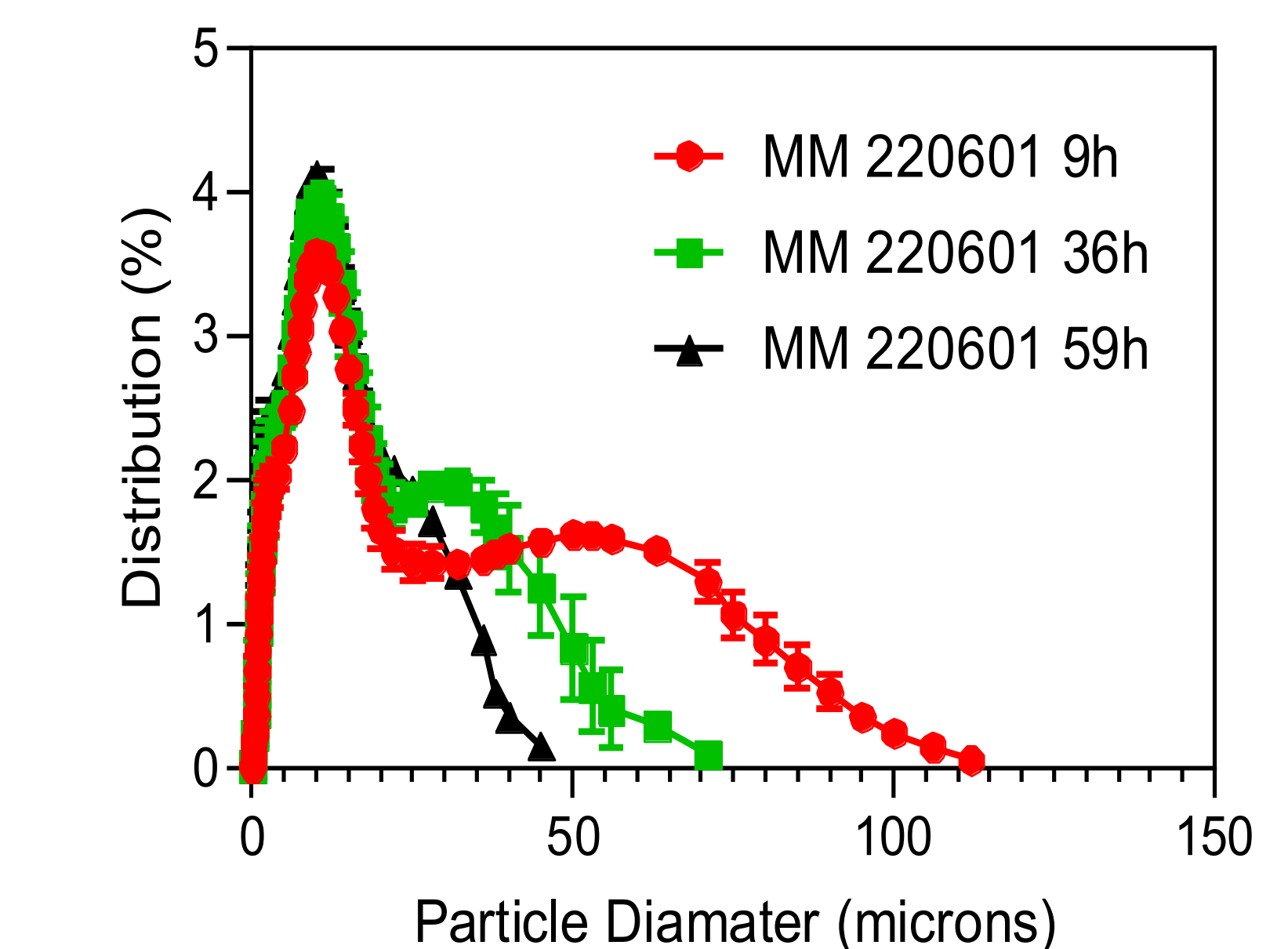
Multi-origin chocolate **sacrifices the uniqueness** of its components.

MM 220601



Particle size decreases with increasing grinding time.

MM 220601



Extra results

Decreasing particle size helps to decrease viscosity and increase yield stress.



UtahStateUniversity