

Milk Viscosity Analysis

Viscosity testing of milk is critical for ensuring consistency in texture, mouthfeel, and processing behavior. By analyzing viscosity at different temperatures and speeds, manufacturers can confirm that milk meets quality standards for consumer satisfaction and its role as an ingredient in various food products.

Background:

- Milk's viscosity is affected by fat content and temperature. Whole milk has higher viscosity than skim milk, and viscosity generally decreases with increasing temperature.



Test Equipment:

- Instrument: Brookfield LVDV2T Viscometer
- Spring Torque Range: LV
- Spindle: ULA (Ultra Low Adapter)
- Software: RheocalcT™ for automated control and data collection

Accessories:

- Enhanced UL Adapter for small sample volumes
- TC-550 SD Bath

Settings:

- Temperatures: 4°C and 21°C
- Speeds: 40, 60, and 80 rpm

Procedure:

1. Connect the Enhanced UL Adapter to the water jacket, maintaining 4°C or 21°C with the TC-502P Bath.
2. Use the ULA spindle, attaching it securely to the viscometer.
3. Set the viscometer speed to 40 rpm, allowing readings to stabilize.
4. Increase the speed incrementally to 60 rpm and then 80 rpm, recording viscosity at each level.
5. Repeat for each temperature setting to observe changes in viscosity across temperatures and milk types.

Observations:

- Figure 1: Shows constant viscosities for each milk type across the speed range at both temperatures.
 - Whole milk consistently exhibits higher viscosity than skim milk at both 4°C and 21°C.
 - Viscosity decreases with temperature increase, demonstrating milk’s temperature-sensitive viscosity behavior.

Results:

- Whole milk has a higher viscosity than skim milk, with both types showing greater viscosity at the lower temperature of 4°C.
- The data confirm that temperature and fat content significantly impact milk’s flow characteristics.

Discussion:

- Testing viscosity across temperatures and speeds ensures milk meets texture and processing standards, critical for both beverage consumption and its role as an ingredient. The LVDV2T Viscometer with the Enhanced UL Adapter provides reliable data for maintaining milk quality across varying storage and usage conditions.

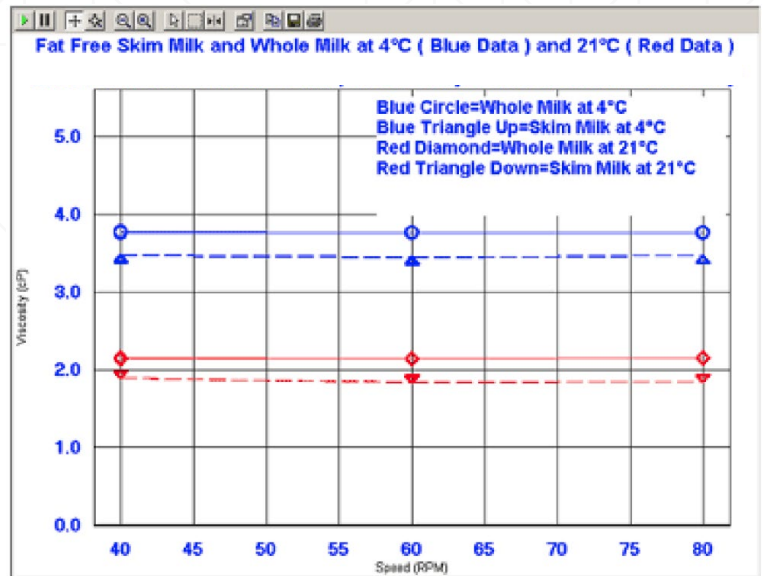


Figure 1