

Effect of processing and formulation on water migration through lipids

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Moisture migration through multi-compartment foods negatively affects product quality and safety. The effect of processing condition, crystallization temperature, emulsifier, solid particle, and storage conditions on vapor migration through lipid moisture barrier were studied. Palm oil and palm oil blends were structured under laminar shear applications and static conditions. Gravimetric experiment was conducted by sealing uniform-sized lipid disks over plastic cups containing known relative humidity (RH), then put into desiccators containing a different known RH. For pure palm oil, lipid barriers formed under laminar shear gave lower water vapor permeability compared to barriers formed under static condition. The addition of emulsifier into the fat system agreed with this result, showing similar trend with sheared samples having lower moisture permeability. Interestingly, when solid particle (cocoa powder) was introduced into palm oil, the opposite trend was observed. These results suggest that media formulation in combination with processing conditions affect moisture barrier properties differently. It would be of interest to look further into the role of formulation in functionality in future studies.