

## Changing bread plastic packaging to biobased packaging

*Biobased packaging materials could be alternatives for petroleum-based plastic film. The performance of commercial biobased packaging materials were compared to petroleum-based polyethylene (PE) for bread packaging application.*

Plastic for packaging has been a major concern worldwide. It is made from oil and causes many problem in the end of use. The more packed product being produced, the more plastic packaging is needed. Limited fossil resources and consideration of its environmental impacts led many industries to look for more renewable resources to make plastic. Moreover, consumers, retailers, and government regulation urge for a more sustainable packaging. Therefore, it is important to find an alternative for petroleum-based plastics. Biobased packaging could be one of the solutions.

Shifting the petroleum-based PE to biobased packaging could be one way to reduce the environmental impact from the packaging material. However, packaging selection for food needs to consider the properties of the material. While biobased packaging could improve the environmental impact, it shall ensure the satisfactory of minimum product protection.

In Sweden, hotdog bun and hamburger bun packed in PE bag with a clip for sealing are mostly fully-baked frozen bread. This type of bread undergoes freezing in the package after baking and have 7-day shelf-life after thawing. The packaging of this bread must preserve the quality of the bun until the end of shelf life.

Biobased polyethylene (bio-PE) could be an option for hotdog bun and hamburger bun packaging. Bio-PE had similar properties with petroleum-based PE reference in term of moisture barrier properties and durability. Moreover, bio-PE can limit the moisture loss of the buns along shelf-life and maintain the texture quality of the buns similarly to conventional PE. It is possible to change the current hotdog bun petroleum-based PE bag to biobased packaging (bio-PE) without any quality differences.

Another alternative of biobased packaging materials is paper laminated with biobased polyethylene terephthalate (paper/bio-PET). Even though this material had lower moisture barrier properties than PE, it can preserve some of the bun quality aspects. However, this material is not transparent which might influence how consumer perceive the product. Biobased packaging with much lower moisture barrier properties, such as Biodolomer®, polylactic acid (PLA), and polybutylene succinate-co-adipate (PBSA) could not maintain the quality of hotdog bun and hamburger bun. These packaging materials resulted in excessive weight loss, change in texture, and dry edge of the bun. These packaging materials might work for other food product applications such as pastries which requires more breathable packaging.