

## Lipase-catalysed production and chemical composition of diacylglycerols from soybean oil deodoriser distillate

### ABSTRACT

Diacylglycerols (DAG) were enzymatically produced by lipase-catalysed esterification of glycerol with fatty acids from soybean oil deodoriser distillate (SODD). Effects of reaction parameters such as reaction time, temperature, enzyme type, enzyme load, substrate molar ratio and water content, as well as the effect of molecular sieves as water adsorbent were studied. Lipozyme RM IM was determined to be the most effective among the lipases screened. The following conditions yielded 69.9% DAG (all percentages are wt/wt): 4 h reaction time, 65 °C reaction temperature, 10% Lipozyme RM IM, 2.5:1 fatty acid to glycerol molar ratio, and 30% molecular sieves. DAG synthesis of 11.9% was still observed at 10% water content. After purification, the product oil contained 86.3% DAG. This oil consisted predominantly of 1,3-diolein (19.1%), 1-oleoyl-3-linoleoyl-glycerol (18.2%) and 1-oleoyl-2-linoleoyl-glycerol (16.6%). The fatty acid profile of the oil was similar to that of refined, bleached and deodorised (RBD) soybean oil. The % ratio of 1,3- to 1,2-positional isomers of DAG was at 56:44.

**Keyword:** Deodoriser distillate, diacylglycerol, esterification, lipase, Lipozyme RM IM