

## Abstrak

Ketersediaan bahan bakar fosil semakin menipis, akan tetapi kebutuhan akan bahan bakar fosil semakin meningkat seiring peningkatan populasi manusia, dibutuhkan bahan bakar alternatif untuk mengatasinya. Produksi indonesia akan ayam boiler terus meningkat, lemak buangan ayam boiler dapat dimanfaatkan menjadi biodiesel, melalui proses transesterifikasi. Penelitian ini bertujuan untuk menguji kelayakan biodiesel lemak ayam sebagai bahan bakar alternatif dan menganalisa peformansi mesin diesel dengan menggunakan campuran bahan bakar dexlite dengan 5%,10%,15%,20%,25% biodiesel lemak ayam (*fatty acid methyl ester galus gallus domesticus*) pada variasi putaran 1800 rpm, 2000 rpm, 2200rpm,2400 rpm,dan 2600 rpm dan variasi beban 3,5Kg dan 4,5 Kg. Tahapan kerja yang dilakukan dalam penelitian ini, pembuatan biodiesel dengan proses transesterifikasi, pengujian karakteristik, pencampuran biodiesel dengan dexlite, pengujian nilai kalor pada bom kalorimeter, dan pengujian performansi mesin diesel TD-115 MKII. Dengan menganalisa data didapat, biodiesel telah memenuhi standard nasional, torsi menurun 4%-12.87%, daya menurun 4%-12.87%,  $m_f$  meningkat 1,75%-7,1%, AFR menurun 5,3%-20,1%, Efisiensi Volumetris menurun 3,7%-14,5%, daya actual menurun 7,5%-25,5%, efesiensi thermal menurun 4,8%-25,5%, SFC meningkat 10%-43,7%, heat loss menurun 3,5%-14,5%, Persentasi Heat loss menurun 2,2%-14,13 %.

Kata kunci: Lemak Ayam, Biodiesel Lemak Ayam, Dexlite, Performansi Mesin Diesel.

## ABSTRACT

Availability of fossil fuels dwindling, but the need for fossil fuels increases due to the increase in human population, alternative fuels needed to overcome them. Indonesian production on boiler chicken increase annually, boiler chicken fat wasted can be harnessed into biodiesel, through a transesterifikasi process . This research aims to examine the feasibility of biodiesel as alternative fuel and analyze diesel engines performance by using fuel mixture dexlite with 5%, 10%, 15%, 20%, 25% chicken fat biodiesel (*fatty acid methyl ester gallus gallus domesticus*) with varians on rasion 1800 rpm,2000 rpm, 2200 rpm,2400 rpm, and 2600 rpm and varians on load 3,5 Kg dan 4,5 Kg. Stages of work done in this research, produce of biodiesel by transesterification process, testing characteristic, blending biodiesel with dexlite, testing calorific value in a bomb calorimeter, and performance testing of diesel engines TD 115 - MKII. By analyzing the data obtained biodiesel has met national standard, torque decreased 4%-12,87%, power decreased 4%-12,87%,  $m_f$  increased 1,75%-7,1 %, AFR decreased 5,3%-20,1%, volumetric efficiency decreased 3,7%-14,5%, actual power decreased 7,5%-25,5%, thermal efficiency decreased 4,8%-25,5%, SFC increased by 10%-43,7%, heat loss decreased 3,5%-14,5 %, Percentage heat loss decreased 2,2%-14,13 %.

Key word : chicken fat, chicken fat biodiesel, dexlite, Diesel Engine Performance