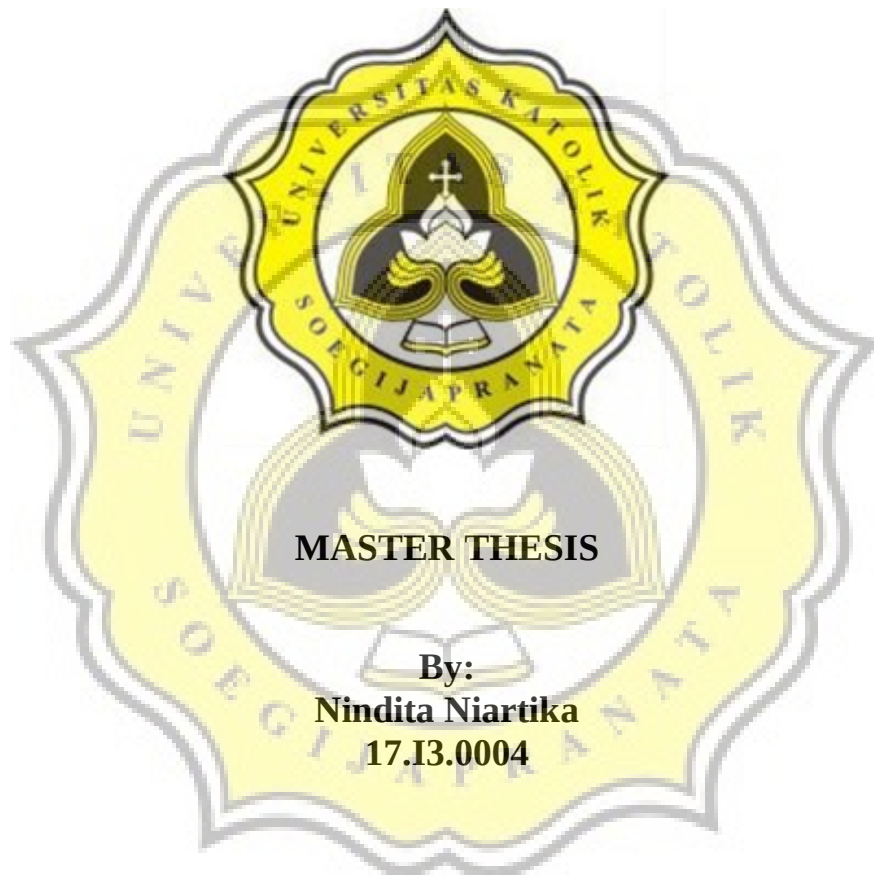


**THE ASSESSMENT OF CARBON FOOTPRINT GENERATED BY
SINGLE USE PLASTICS WASTE FROM FAST FOOD CHAINS
IN SEMARANG**

***PENAKSIRAN JEJAK KARBON YANG DIHASILKAN OLEH
LIMBAH PLASTIK SEKALI PAKAI DARI RESTORAN CEPAT SAJI
DI SEMARANG***



MASTER THESIS

By:

Nindita Niartika

17.I3.0004

**MASTER OF FOOD TECHNOLOGY PROGRAM
SOEGIJAPRANATA CATHOLIC UNIVERSITY
SEMARANG**

2019

STATEMENT OF THESIS AUTHENTICITY

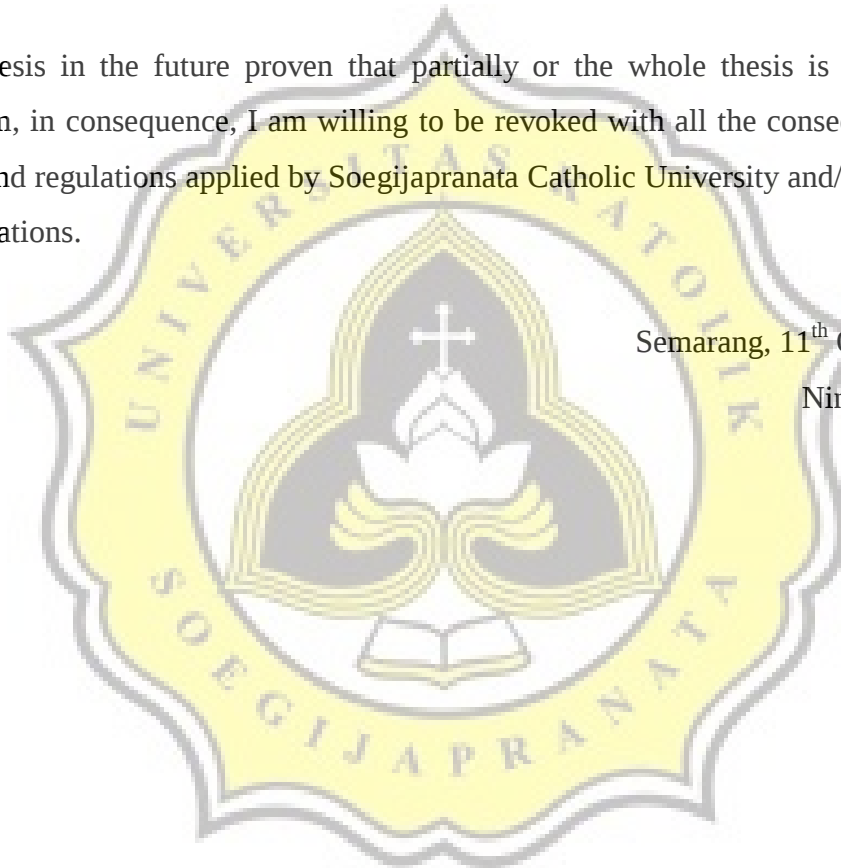
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Semarang, 11th October 2019

Nindita Niartika

17.I3.0004



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MASTER THESIS

Submitted to the
Master Program in Food Technology, Soegijapranata Catholic University to fulfill the
requirements needed to obtain a Masters in Food Technology

By:

Nindita Niartika

17.I3.0004

**MASTER OF FOOD TECHNOLOGY PROGRAM
SOEGIJAPRANATA CATHOLIC UNIVERSITY
SEMARANG**

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MASTER THESIS

THE ASSESSMENT OF CARBON FOOTPRINT GENERATED BY SINGLE USE PLASTICS WASTE FROM FAST FOOD CHAINS IN SEMARANG

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This master thesis has been approved and defended in front of the
examination committee on 11th October 2019

This thesis is accepted as part of the requirements
needed to obtain a Masters in Food Technology

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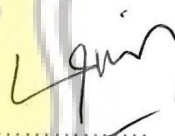
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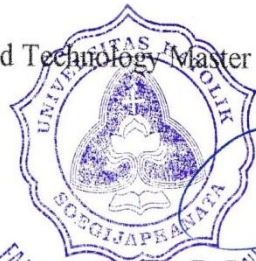
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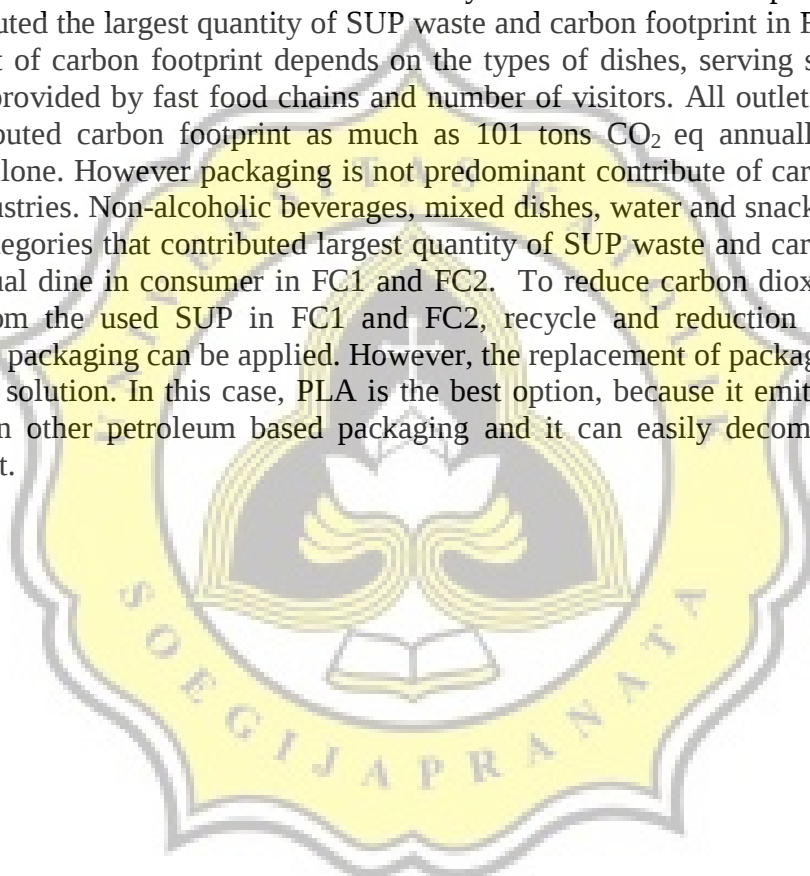


Dean

(Dr. R. Probo Y. Nugraedi, S.TP, M.Sc)

ABSTRACT

Nowadays, fast food consumption become a part of modern lifestyle. Plastic has known to be packaging material that commonly used in fast food restaurants. Plastic can contribute to global warming due to the release of carbon emission. Fast food restaurant also contribute in disposing plastic waste, especially single use plastics (SUP). Therefore, there is a need to study the contribution of fast food restaurants in Semarang's waste stream and the environmental burden expressed as carbon footprint. In this study, fast food restaurants in Semarang are classified as burger based fast food chains (FC1) and chicken based fast food chains (FC2). FC1 and FC2 generates higher amount of SUP in weekends rather than weekdays. PP and PET are the plastic polymers that contributed the largest quantity of SUP waste and carbon footprint in FC1 and FC2. The amount of carbon footprint depends on the types of dishes, serving size, types of packaging provided by fast food chains and number of visitors. All outlets of FC1 and FC2 contributed carbon footprint as much as 101 tons CO₂ eq annually from SUP packaging alone. However packaging is not predominant contribute of carbon footprint in food industries. Non-alcoholic beverages, mixed dishes, water and snacks and sweets are food categories that contributed largest quantity of SUP waste and carbon footprint per individual dine in consumer in FC1 and FC2. To reduce carbon dioxide emission released from the used SUP in FC1 and FC2, recycle and reduction the size and thickness of packaging can be applied. However, the replacement of packaging assumed to be better solution. In this case, PLA is the best option, because it emits less carbon dioxide than other petroleum based packaging and it can easily decomposed in the environment.



ABSTRAK

Sekarang ini, konsumsi makanan cepat saji telah menjadi bagian dari pola hidup modern. Plastik merupakan jenis bahan pengemas yang biasa digunakan di restoran cepat saji. Plastik dapat berkontribusi terhadap pemanasan global karena emisi karbon yang dihasilkan. Restoran cepat saji juga berkontribusi terhadap sampah plastik, terutama plastik sekali pakai (SUP). Oleh karena itu, diperlukan studi mengenai kontribusi restoran cepat saji pada aliran limbah di Semarang dan beban lingkungan yang dinyatakan dengan jejak karbon. Dalam penelitian ini, restoran cepat saji di Semarang diklasifikasikan sebagai restoran cepat saji berbasis burger (FC1) dan restoran cepat saji berbasis ayam goreng (FC2). FC1 dan FC2 menghasilkan jumlah SUP yang lebih tinggi di akhir pekan dibandingkan hari kerja. PP dan PET adalah polimer plastik yang berkontribusi paling tinggi terhadap limbah SUP dan jejak karbon tertinggi di FC1 dan FC2. Nilai jejak karbon dapat ditentukan berdasarkan tipe dari makanan, porsi penyajian, jenis pengemas yang disediakan di restoran cepat saji, dan jumlah pengunjung. Semua outlet FC1 dan FC2 berkontribusi terhadap nilai jejak karbon sebanyak 101 ton CO₂ eq setiap tahun, yang mana hanya berdasarkan dari kemasan SUP. Namun, kemasan tidak berkontribusi secara besar terhadap pembentukan jejak karbon pada industri makanan. Minuman non alkohol, hidangan campuran, air mineral dan kudapan and makanan pencuci mulut merupakan kategori makanan yang paling banyak berkontribusi terhadap pembentukan jejak karbon per individu pengunjung yang makan ditempat di FC1 dan FC2. Untuk mengurangi terbentuknya emisi karbon dioksida dari penggunaan SUP di FC1 dan FC2, daur ulang serta reduksi ukuran dan ketebalan kemasan dapat dilakukan untuk mengurangi emisi karbon dioksida. Namun, penggantian jenis pengemas dinilai sebagai solusi yang lebih baik. Pada kasus ini, PLA merupakan pilihan terbaik, karena mengeluarkan emisi karbon dioksida yang lebih rendah dibandingkan dengan kemasan yang berbahan dasar minyak bumi dan dapat terurai dengan mudah di lingkungan.

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In conducting this research, the author realizes that there were a lot of unintended errors because of the limitation of the author. Therefore the author apologizes if this research is not perfect. The authors will be pleased if there are any critics and advice on this research. The author hopes that this research can be useful to readers and all of the people

Semarang, 11th October 2019

Author,

Nindita Niartika



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