

**STUDY OF CORRELATION BETWEEN SUBJECTIVE  
AND OBJECTIVE TEXTURE MEASUREMENT OF  
BEEF SAUSAGES**

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**STUDI KORELASI ANTARA PENGUKURAN TEKSTUR  
SECARA SUBJEKTIF DAN OBJEKTIF PADA SOSIS SAPI**

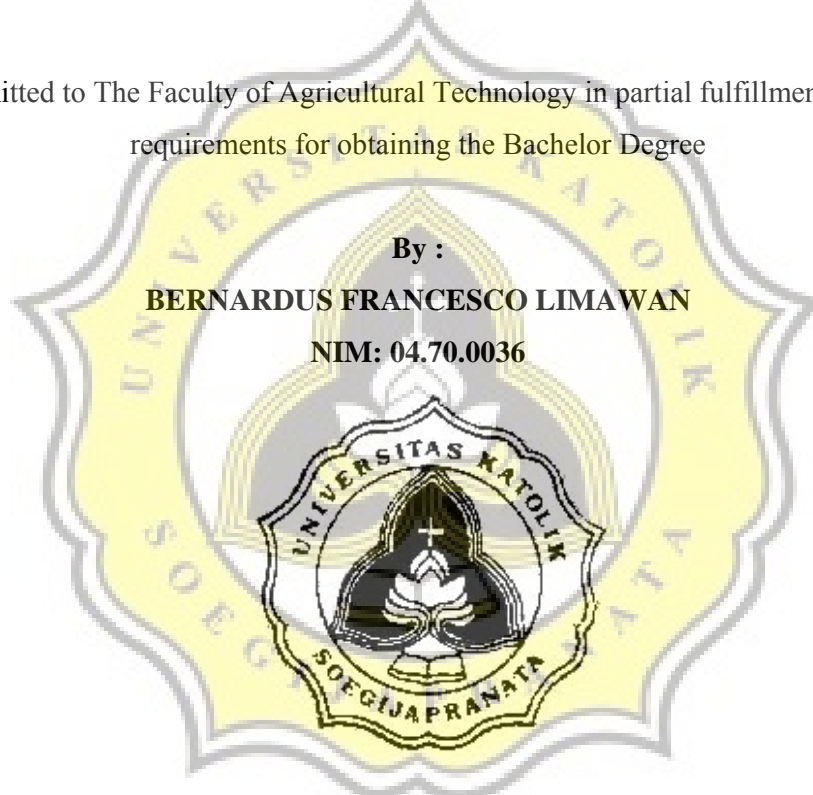
**THESIS**

Submitted to The Faculty of Agricultural Technology in partial fulfillment of the  
requirements for obtaining the Bachelor Degree

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SEMARANG**

**2008**

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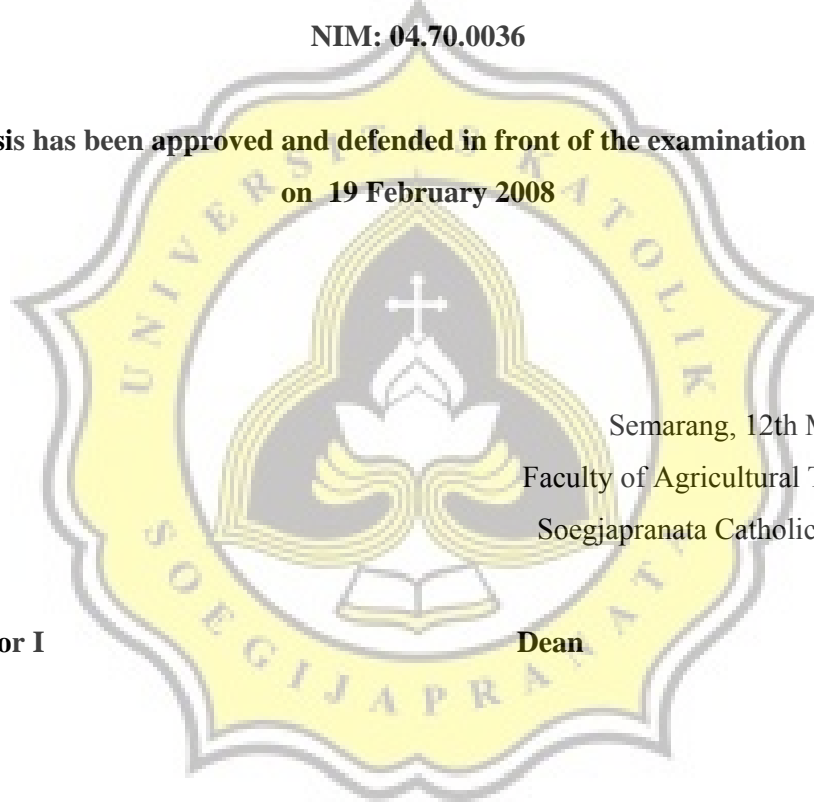
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**This thesis has been approved and defended in front of the examination committee  
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## SUMMARY

Texture is one of the main factors in food quality. For meat products like sausage, texture is very important and often affects consumers' preference. There are two methods to measure texture of a food product. Subjective measurement, often conducted as sensory test, and objective measurement which uses tools like texture analyzer. Each method has its own advantages and disadvantages. The aim of this study is to determine textural standards for beef sausage that is the most accepted by the consumers and also to observe the correlation level between subjective and objective textural measurements. Based on the survey conducted on supermarkets at Semarang, six beef sausages brands with better market acceptance (Bernardi, Farm house, Villa, Vida, Fino, and Vigo) were used as samples for this research. Focus Group Discussion (FGD) was used to determine texture attributes that are considered to be important in beef sausage. It was concluded that hardness, elasticity, and chewiness are the most important factors in beef sausage textural quality. Proximate analysis was conducted to obtain supporting data of beef sausage's nutritional content. Thirty one untrained panelists were used in hedonic ranking test. The result shows the ranking of sausage brands that are preferred and disliked for their taste, color, texture, and also for their overall preference. Another group of volunteered panelists were selected and trained in a series of tests to obtain 10 trained panelists. Those trained panelists were used in rating intensity test to assess texture attributes' values (subjective measurement). Texture attributes' values were also tested using Texture Profile analysis (TPA) method, by Llyod Texture Analyzer instrument. Output of subjective and objective measurement was correlated using SPSS program non parametric, Spearman test. Correlation test between objective and subjective measurement for hardness attribute showed a significant and high correlation value. While correlation test for elasticity and chewiness attributes showed insignificant and low correlation value. Therefore, it can be concluded that measurement of hardness using subjective (sensory) approach can be replaced with objective (instrumental) approach. Based on ranking hedonic test, Bernardi is the most preferred beef sausage. Bernardi has the best texture, taste, and overall acceptance. This output can be used as comparison for beef sausage manufacturers to create beef sausage with similar properties with Bernardi beef sausage.

## RINGKASAN

Tekstur adalah salah satu faktor penting dalam kualitas bahan pangan. Terlebih pada produk olahan daging, tekstur sangatlah penting dan seringkali mempengaruhi kesukaan konsumen. Ada dua cara untuk mengukur tekstur bahan pangan. Pengukuran subjektif, seringkali dilakukan dalam bentuk uji sensori, dan pengukuran objektif yang menggunakan alat seperti *texture analyzer*. Baik uji subjektif maupun uji objektif memiliki kelebihan dan kekurangannya masing-masing. Tujuan dari penelitian ini adalah untuk menentukan kisaran nilai atribut tekstur yang paling disukai konsumen pada produk sosis sapi, selain itu juga untuk mengetahui tingkat korelasi antara pengukuran tekstur secara objektif dan subjektif. Berdasar pada survei yang dilakukan pada supermarket-supermarket di kota Semarang, enam merk sosis sapi dengan penjualan tinggi (Bernardi, Farm house, Villa, Vida, Fino, and Vigo) dipilih sebagai sample dalam penelitian ini. *Focus Group Discussion* (FGD) digunakan untuk mengetahui atribut-atribut tekstur yang penting pada produk sosis sapi. Disimpulkan bahwa *hardness*, *elasticity*, dan *chewiness* adalah atribut-atribut tekstur yang paling penting pada kualitas tekstur sosis sapi. Uji kimia, proximat, dilakukan untuk mendapatkan data pendukung yaitu nilai nutrisi pada sosis sapi. Sebanyak tiga puluh satu panelis tidak terlatih digunakan pada uji *hedonic ranking test*. Hasilnya menunjukkan tingkatan (*ranking*) merk merk sosis sapi dari yang paling disukai, hingga yang paling kurang disukai rasanya, warna, tekstur, dan juga kesukaan secara keseluruhan. Kelompok panelis yang lain diseleksi dan dilatih untuk digunakan sebagai panelis terlatih. Sepuluh panelis terlatih ini digunakan pada uji *rating intensity* untuk mengukur nilai-nilai atribut tekstur secara subjektif. Nilai-nilai atribut tekstur juga diukur secara objektif menggunakan alat *Lloyd Texture Analyzer* dengan metode *Texture Profile analysis* (TPA). Hasil akhir nilai tekstur dari uji subjektif dan objektif ini diuji nilai korelasinya menggunakan program SPSS dengan uji non parametrik, yaitu uji *Spearman*. Uji Korelasi pengukuran tekstur secara subjektif dan objektif untuk atribut *hardness* (kekerasan) menunjukkan nilai korelasi yang signifikan dan tinggi. Sedangkan untuk atribut *elasticity* (keelastisan) dan *chewiness* (kekenyalan) nilai korelasi uji subjektif dengan uji objektifnya tidak signifikan. Dapat dikatakan bahwa uji objektif (menggunakan alat) dapat menggantikan uji subjektif apabila digunakan untuk mengukur kekerasan bahan pangan. Berdasarkan uji *ranking hedonik*, Bernardi memiliki tekstur, rasa, dan penerimaan keseluruhan yang paling baik Hasil ini dapat dijadikan pembandingan bagi produsen sosis sapi untuk membuat sifat rasa dan tekstur seperti yang ada pada sosis sapi merk Bernardi.

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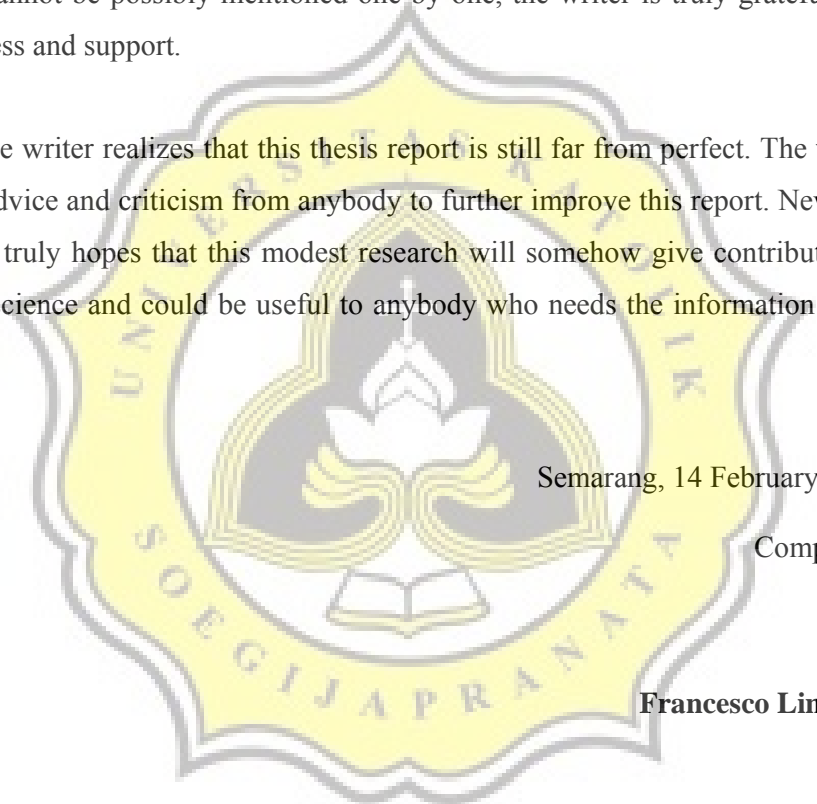
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Semarang, 14 February 2008

Compiler,

**Francesco Limawan**



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