

**TESIS**

**ANALISIS FAKTOR YANG BERHUBUNGAN DENGAN AKTIVITAS  
*CHOLINESTERASE* DALAM DARAH PETANI HORTIKULTURA  
(Studi pada Keluarga Petani Penyemprot Pestisida Organofosfat di  
Kelurahan Pattapang, Kecamatan Tinggimoncong-Malino, Kabupaten  
Gowa, Provinsi Sulawesi Selatan)**



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PROGRAM MAGISTER  
PROGRAM STUDI KESEHATAN DAN KESELAMATAN KERJA  
SURABAYA  
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**TESIS**

**Untuk memperoleh gelar Magister Kesehatan dan Keselamatan Kerja  
Program Studi Kesehatan dan Keselamatan Kerja  
Fakultas Kesehatan Masyarakat  
Universitas Airlangga**

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SURABAYA  
2015**

## PENGESAHAN

**Dipertahankan di depan Tim Penguji Tesis  
Program Studi Kesehatan dan Keselamatan Kerja  
Fakultas Kesehatan Masyarakat Universitas Airlangga  
dan diterima untuk memenuhi persyaratan guna memperoleh gelar  
Magister Kesehatan dan Keselamatan Kerja (M.KKK)  
pada tanggal 23 Februari 2015**



### Tim Penguji:

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3. Dr. Diah Indriani, S. Si., M. Si  
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6. Dr. Lilis Sulistyorini, Ir., M.Kes

**PERSETUJUAN**

**TESIS**

**Diajukan sebagai salah satu syarat untuk memperoleh gelar  
Magister Kesehatan dan Keselamatan Kerja (M.KKK)  
Program Studi Kesehatan dan Keselamatan Kerja  
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## PERNYATAAN TENTANG ORISINALITAS

Yang bertanda tangan di bawah ini, saya:

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Menyatakan bahwa saya tidak melakukan kegiatan plagiat dalam penulisan tesis saya yang berjudul:

**ANALISIS FAKTOR YANG BERHUBUNGAN DENGAN AKTIVITAS  
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Provinsi Sulawesi Selatan)**

Apabila suatu saat nanti saya terbukti saya melakukan tindakan plagiat, maka saya akan menerima sanksi yang telah ditetapkan.

Demikian surat pernyataan ini saya buat dengan sebenar-benarnya.

Surabaya, 23 Februari 2015

Maarifah Dahlan

## KATA PENGANTAR

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Tesis ini berisikan mengenai faktor-faktor yang mempengaruhi aktivitas *cholinesterase* dalam darah keluarga petani penyempron insektisida organofosfat dan hasil temuan dapat membantu para peneliti meningkatkan kualitas analisis data sebelumnya banyak terjadi kesalahan dalam proses pengolahan data.

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4. Dr. Abdul Rohim Tualeka, Drs., M.Kes selaku ketua penguji dan anggota penguji Ibu Dr. Lilis Sulistyorini, Ir., M.Kes., Ibu Dr. Diah Indriani, S.Si., M.Si., dan Bapak Sahabat Sutanto, S.KM., M.Kes atas kesediaan membimbing demi perbaikan tesis ini.
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Demikian, semoga tesis ini bisa memberikan manfaat bagi diri kami sendiri dan pihak lain yang menggunakan.

Surabaya, 23 Februari 2015

Penulis

## SUMMARY

### ANALYSIS OF FACTORS RELATED TO BLOOD CHOLINESTERASE ACTIVITY IN HORTICULTURAL FARMERS

(A Study of Organophosphates Spraying Farmers and Their Wives in Kelurahan Pattapang, Kecamatan Tinggimoncong-Malino of Gowa, South Sulawesi Province)

Tinggimoncong is a sub-district in Gowa, South Sulawesi Province, located in a plateau with an area of 148.87 square kilometers. Geographically, it is located on the south latitude of  $5^{\circ} 10' - 5^{\circ} 20'$  and the east longitude of  $119^{\circ} - 20'$ . The study location, Kelurahan Pattapang, belongs to the catchment area of the Jeneberang Hulu watershed subzone. Horticulture, especially vegetables, in the upstream of Jeneberang watershed has become the most popular choice for living in Kelurahan Pattapang and the vicinity.

The systemic pesticides widely used by farmers in Indonesia, including those in Kelurahan Pattapang, are of organophosphate class. Organophosphates enter the human body through the digestive tract, inhalation, and skin. Organophosphate compounds are most commonly associated with poisoning in humans by inhibiting the activity of blood cholinesterase.

Results of the preliminary survey in the study location of Kelurahan Pattapang showed that there were many health complaints experienced by farmers during and after spraying the pesticides, such as headaches, vomiting, muscle cramps, and even fainting. Uncontrolled use of pesticides along with the use of inadequate personal protective equipment at work, smoking at work, and the lack of habitual hand washing after contact with the pesticides are of great concern. Thus, there is a need for an increase in an understanding of the hazardous effects of the pesticides on health.

The purpose of the present study was to determine the factors associated with the activity of blood cholinesterase in the families of horticultural farmers spraying organophosphates in Kelurahan Pattapang, Kecamatan Tinggimoncong – Malino. This study was quantitative and observational –analytical survey with a cross-sectional design to analyze factors associated with the activity factors associated with the activity with the activity of blood cholinesterase in the families of horticultural farmers spraying organophosphates. The study was conducted in Desember 2014 to January 2015.

Population was all the horticultural farmers and their wives, as many as 175 people, who used organophosphates sprays in Kelurahan Pattapang, Kecamatan Tinggimoncong- Malino, Gowa. Sample was 92 individuals, consisting of 46 husbands and wives. The dependent variable was the activity of blood cholinesterase, while the independent variables were age, sex, nutritional status, smoking habits, knowledge of the application of pesticides, personal hygiene, use of PPE, length of employment, years of service, the use of insecticides, spraying frequency, and the interval between the spraying time and blood sampling.



Results of the examination of blood cholinesterase activity in families of farmers spraying organophosphates showed an average value of 11400 U/L with a minimum value of 7304 U/L and maximum value of 16882 U/L. Based on this values, the blood cholinesterase activity of the respondents remained above to minimum reference value. Results of the correlational analysis with the value of  $<0,05$  between the dependent variable of blood cholinesterase activity and the independent variables based on the respondents characteristics indicated there was no correlation between age and blood cholinesterase activity ( $p= 0,827$ ;  $r_s= 0,023$ ); there was no correlation between sex and blood cholinesterase activity ( $p=0,622$ ); there was no correlation between body max index and blood cholinesterase activity ( $p=0,142$ ;  $r_s=-0,154$ ); and there was no correlation between smoking and blood cholinesterase activity ( $p=0,410$ ).

Results of the correlational analysis with the value of  $<0,05$  between the dependent variable of blood cholinesterase activity and the independent variables based on the occupational characteristics showed that there was no correlation between knowledge of the application of pesticides and blood cholinesterase activity ( $p=0.596$ ;  $r_s=-0.154$ ); and there was a correlation between personal hygiene and blood cholinesterase activity ( $p = <0.001$ ;  $r_s = -0.359$ ); there was a correlation between the use of PPE and blood cholinesterase activity ( $p = <0.001$ ;  $r_s= 0.562$ ); there was a correlation between years of service and blood cholinesterase activity ( $p=0.019$ ;  $r_s=0.168$ ); there was a correlation between spraying frequency and blood cholinesterase activity ( $p=0.001$  ;  $r_s = 0.328$ ); there was no correlation between the use of insecticides and blood cholinesterase activity ( $p = 0.205$ ;  $r_s = 0.314$ ); and there was a correlation between the interval of blood sampling and spraying time and blood cholinesterase activity ( $p = <0.001$ ;  $r_s = -0.502$ ).

Based on the results, it is expected that the chairman of the farmer groups “P4S Buluballea” to routinely provide insight to the farmers regarding the hazards of pesticides and how to apply pesticides properly. Respondents are expected to practice personal hygiene more strictly, such as after contact with pesticides, especially before eating, drinking, or smoking; immediately washing the clothes before going home; using complete personal protective equipment when working with the pesticides as recommended by the pesticides label; and check themselves up regularly for blood cholinesterase activity so as to avoid poisoning as early as possible.