

**IDENTIFIKASI TINGKAT KESEGERAN IKAN NILA DI PASAR  
COLOMBO YOGYAKARTA BERBASIS *ELECTRONIC NOSE* DAN  
*PRINCIPLE COMPONENT ANALYSIS***

INTISARI

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*Electronic nose* merupakan instrumen yang dibuat dengan menirukan kemampuan hidung manusia untuk mendeteksi dan mengidentifikasi senyawa aroma. *E-nose* pada umumnya terdiri dari *sensor array* yang dapat mengukur aroma berdasarkan pola sinyal spesifik yang dihasilkan setiap sampel. Hasil pengukuran yang disimpan dalam bentuk data *MS Excel* perlu diolah melalui *pre-treatment* agar dapat dianalisis lebih lanjut dengan metode pengenalan pola. *E-nose* digunakan untuk mengukur tingkat kesegaran ikan nila di Pasar Colombo melalui identifikasi senyawa aroma berdasar standar ikan nila segar dan tidak segar. Pengukuran kondisi ikan nila segar dilakukan segera setelah ikan dimatikan, sedangkan ikan tidak segar diukur setelah inkubasi 12 jam pada suhu kamar. Sampel penelitian berupa 150 ekor ikan nila yang dijual di Pasar Colombo, yang diambil secara random, baik waktu maupun tempat, Satu kali proses pengujian meliputi tiga tahap, terdiri dari *flushing* 120 detik, *collecting* 180 detik, dan *purging* 120 detik. Pengambilan data dilakukan sebanyak 50 kali ulangan untuk setiap sampel. Data tersebut kemudian dianalisis menggunakan empat metode *pre-treatment* berupa *absolute data*, *normalize absolute data*, *relative data*, dan *normalize relative data*, yang selanjutnya dievaluasi menggunakan analisis metode *Principle Component Analysis* (PCA). Hasil penelitian menunjukkan bahwa tingkat kesegaran ikan nila di Pasar Colombo mendekati kualitas ikan segar, sesuai hasil pengujian menggunakan PCA bahwa pola sinyal aroma ikan nila dari pasar Colombo lebih mendekati pola sinyal aroma ikan segar. Selain itu, kelembaban ikan nila dari pasar Colombo berada pada kisaran 58-60%, mendekati kelembaban ikan segar pada kisaran 59-61%, lebih rendah dari ikan tidak segar pada kisaran 63-78%. Pengujian amonia menggunakan tes-kit pada ikan nila dari pasar Colombo menunjukkan kadar di bawah 5 PPM, mendekati kadar ammonia ikan segar yang mendekati 0 PPM, lebih rendah dibandingkan kadar ammonia ikan nila tidak segar pada level 10 PPM.

Kata kunci: *electronic nose*, ikan nila, *principle component analysis*, tingkat kesegaran

**FISH FRESHNESS ASSESSMENT OF TILAPIA  
SOLD IN COLOMBO MARKET YOGYAKARTA USING  
ELECTRONIC NOSE AND PRINCIPLE COMPONENT ANALYSIS**

**ABSTRACT**

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*Electronic nose* is an instrument that mimic human nose ability to detect and identify aroma compounds through sensor array which measures aroma based on specific signal pattern generates by samples. Measurement results saved as MS Excel data was then subjected to pre-treatment stages for further pattern recognition analysis. E-nose was used to measure freshness of tilapia sold in Colombo market based on aroma compound identification compared to those of fresh and unfresh fish, which then compared to moisture and ammonia content data. Fresh fish was measured immediately after death, while the not-so-fresh was measured after 12 hours of room temperature incubation. Samples were 150 tilapia sold in Colombo traditional market randomly picked both time and place. A stage of assessment consists of 120 seconds of flushing, 180 seconds collecting, and 120 seconds purging, repeated 50 times for each samples. All collected data was subjected for pre-treatment as absolute data, normalize absolute data, relative data, and normalize relative data, which then evaluated using Principle Component Analysis (PCA) method. Results indicated that the freshness of tilapia sold in the Colombo market was close to the quality of fresh fish based on aroma compound signal pattern by PCA analysis. This result was confirmed by moisture content of market's fish ranged between 58-60% which close to those of fresh fish at 59-61%, lower than unfresh fish at 63-78%. Colombo market's fish also had 5 ppm ammonia content determined using test-kit, close to that of fresh fish at near 0 ppm, visibly lower than that of not-fresh tilapia at 10 ppm.

Keywords: electronic nose, freshness assessment, Principle Component Analysis, tilapia