

Cattle ID system shows its muzzle

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Maybe it sounds like a cow and bull story, but researchers in Egypt are developing a biometric identification system for cattle that could reduce food fraud and allow ranchers to control their stock more efficiently. The system described in the *International Journal of Image Mining* uses the unique features of a prominent part of the animal to identify the beasts. No, it's not hoof prints or an udder body part - it's the bovine muzzle, no pair of which are exactly alike, according to computer scientist Hamdi Mahmoud of BeniSuef University, in Cairo.

Meat products are currently a vital part of the [global food supply](#), with beef being a major component of that trade. However, international markets, emerging infectious diseases and criminal activity mean that there is always a risk of inferior products hitting the supermarket shelves. There have been numerous large-scale incidences of [food poisoning](#) in various countries as well as fraudulently mislabeled products. Other quality control problems are also all too common.

Mahmoud and colleague Hagar Mohamed Reda El Hadad explain that they were on the horns of a dilemma wondering how to improve public health and reduce [food fraud](#) in cattle. Traditionally, tracking cattle has involved tattooing, ear notching, ear tags and branding. More recently, barcodes, retinal vascular pattern recording and [radio frequency identification](#) (RFID) tags have been used as more high-tech alternatives. Blood tests and DNA identification have not yet proven themselves immune to fraud.

The team realized that the ridges and valleys on the skin of the bovine

muzzle are unique from animal to animal, just as are human fingerprints. They weren't the first to recognize this, ink prints from cattle have been used for stock records since the 1920s. Their innovation is to move the bull (and the cow) into the modern era and they have developed a multiclass support vector machine (MSVM), which they can teach to "recognize" different muzzles for authentication of the muzzle print of a given beast. The preliminary teaching process showed 100% identification accuracy of Daisy and her friends from sample muzzle prints and in actual tests accuracy was 94%.

The researchers are now working on cutting the computer processing time for analysis so that they can assimilate and classify more images for the MSVM training and boost accuracy still further.

More information: Mahmoud, H.A. and El Hadad, H.M.R. (2015) 'Automatic cattle muzzle print classification system using multiclass support vector machine', *Int. J. Image Mining*, Vol. 1, No. 1, pp.126-140. www.inderscience.com/info/inar ... icle.php?artid=70022

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