

Microbiological identification in *Kundi*, an Intermediate Moisture Meat (IMM) product

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Introduction Meat and meat products are high in nutritive value and because of this they can only remain fresh for a short time before spoilage sets in, but simple preservative techniques can reduce spoilage. One such simple technique is Intermediate Moisture Meat processing (IMM). Obanu (1981), observed that IMM are shelf stable under the tropical climate without refrigeration and may be eaten directly with or without rehydration. Ogunsola and Omojola (2008) stated that IMM is used to describe meat products that have less than 30% of moisture. *Kundi* is one of such IMM products that is easy to prepare. It is therefore the objective of this study to identify the microbial loads in *Kundi* products.

Material and methods Beef used for this study was obtained from the slaughter slab of the department of Animal Science, University of Ibadan, Oyo state, Nigeria. Semimembranous muscle from the hindquarter, weighing 2kg from 2-3years old White Fulani animals was used. Meat was trimmed of all external fats, nerves, blood vessels, excess epimysial connective tissues and deboned and wash with water. The chunks were held overnight for 24 hours at 4 °C, cut into sizeable small portion of 70 – 90grams of 6cm - 8cm wide. *Kundi* process involves two methods of preservations; boiling and drying. Meat samples were boiled in a pressure cooker for 30minutes at 100°C and then oven dried at 170 °C for 3 hours. Microbial status was determined by isolating and identifying and characterizing the organisms according to the method described by Norris and Ribbon (1971). The organisms were identified using their colour and the shape of their colonies. The identification was carried out monthly during six month of storage. Samples were stored at room temperature on the shelf according to Sonaiya (1997) in the departmental laboratory, they were not packaged and samples gave 32.09 % as the final moisture content.

Results Fungi and mold were identified; they include *Aspergillus flavus*, *Aspergillus niger*, *Penicillin spp*, *Rhizopus spp*, *Mucor spp* and *Fusarium spp*. Most of the Fungi isolated were xerophilic, which are organisms that are capable of growth at low water activity (a_w) of less than 0.83 a_w are well adapted to dry arid partially dry food (Pitt, 1975). Alonge (1984) screened some Fungi isolated from *Kundi* products for aflatoxin. No toxin was detected because all the organisms identified grow at a very low water activity e.g *Aspergillus flavus* grows at a_w of 0.75. Leister *et al* (1981) reported that aflatoxin cannot be found in meat products with water activity a_w below 0.83. The dried meat in this study and that study by Alonge (1984) had a_w values below 0.83.

Table 1 Xerophilic Fungi isolated from *Kundi* incubated at 73°C

Microbes	Descriptions
<i>Aspergillus flavus</i>	Large bright – green colonies with yellowish centres, Sterigmata, Uniserate
<i>Aspergillus niger</i>	Black radiating colonies with large conidia heads was seen
<i>Penicillium spp</i>	Had distinct blue – green white at first ten coloured after conidial matures
<i>Rhizopus spp</i>	The fungus quickly filling the culture plate with a dense colony aerial mycelium at first white and later becomes grey
<i>Mucor spp</i>	Fast growing fungus filling a Petri plate with colony aerial mycelium at first white and later becoming dark grey brown or yellow
<i>Fusarium spp</i>	This fungus was at first white in colony or woody then it frequently becomes pale in the hyphae or in the substrate

Conclusion Results shows that at 6 months of storage, microbiological organisms identified were fungi and molds, and since *Kundi* is a ready to cook meat product, and that the organisms identified are not toxigenic but xerophilic, thus *Kundi* is a good Intermediate Moisture Meat.

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References

- Alonge. 1984. Smoke preservation of meats in Nigeria: Quality and public health aspects Ph.D Thesis University of Ibadan, Ibadan.
- Ogunsola O. O and Omojola A.B. 2008. Nutritional evaluation of a Dehydrated Shredded Meat Product, (Danbunama). Pakistan, Journal of Nutrition 7, 554 – 556.