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## Meat and Muscle Biology™



## Level of Polycyclic Aromatic Hydrocarbon (Pahs) and Phenols in Meat Products Due to Processing Methods

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### Objectives

Health challenges may arise from eating meat products not properly processed. High temperature during smoking of meat products usually above 400°C, could result in production of Polycyclic Aromatic Hydrocarbon (PAHs) and Phenols. (PAHs) which could exhibit cancerous substance affecting human health while Phenols produced could contribute to meat flavor, aroma, taste and overall acceptability.

### Materials and Methods

Ten kg of raw semimembranosus muscles of 2 yr old male White Fulani cattle was used and was differently cut into 2 kg each to produce Nigeria locally consumed meat products namely, Kundi, Kilishi, Balangu, Suya and Asun. Kundi products; meat was cut into 50- 80 g, oven-dried for 3 h at 170°C and smoked for 2 h at 220- 250°C. Kilishi products; meat was cut into 20cm by 25cm of 100 to 150 g, oven-dried for 5 h at 170°C and smoked dried for 2 h at 220- 250°C. Suya products; meat was cut 20 by 25cm of 100– 150 g, oven-dried for 1 h at 170°C and smoked dried for 30 min at 220– 250°C Asun products; meat was sliced into 10cm by 12cm of 40- 50 g, oven-dried 45 min at 170°C and smoke dried for 30 min at 220- 250°C. Balangu products; meat was sized into 10- 12cm of 40

–50 g, oven-dried for 45 min at 170°C and smoke dried for 30 min at 220- 250°C. Final samples were evaluated and compared with the commercial product for PAHs, phenols, proximate composition and palatability status using a completely randomized design in a factorial experiment.

### Results

Kundi from LTSM and CM, and Kilishi from CM had the highest PAHs level (8.00µkg<sup>-1</sup>, 8.80µkg<sup>-1</sup>, and 8.60µkg<sup>-1</sup>) respectively, while the least ( $P < 0.05$ ) values (2.10µkg<sup>-1</sup>) were observed in Asun products produced using all processing methods. Kilishi from CM had the highest phenols level of (1.30µg), and least value (0.10µg) was noticed in Asun products using all processing methods. Kundi products had the highest significantly ( $P < 0.05$ ) values in protein and ash content in all the processing methods. Balangu products had the highest ( $P < 0.05$ ) ether extract content, while moisture content was highest in Asun products. The panelists rated Balangu, Asun and Kilishi products highest ( $P < 0.05$ ) than Kundi and Suya products.

### Conclusion

With higher temperature and duration of time used in smoking animal products, the higher the accumulation the nutrients composition, Phenols compound and the PAHs content (which could affect human health, when consumed).

**Table 1.** The level of Polycyclic Aromatic Hydrocarbon (PAHs) status in Nigeria meat products. (µkg<sup>-1</sup>)

Method <sup>1</sup>	Kundi	Kilishi	Balangu	Suya	Asun	SEM
LTM	8.00 <sup>a</sup>	6.40 <sup>b</sup>	2.50 <sup>f</sup>	3.20 <sup>e</sup>	2.10 <sup>f</sup>	0.001
LOM	3.30 <sup>e</sup>	5.30 <sup>c</sup>	2.10 <sup>f</sup>	2.20 <sup>f</sup>	2.10 <sup>f</sup>	0.001
CM	8.80 <sup>a</sup>	8.60 <sup>a</sup>	4.80 <sup>d</sup>	3.80 <sup>e</sup>	2.10 <sup>f</sup>	0.001

<sup>a-f</sup>Means of different alphabet in both the column and row are significantly different ( $p < 0.05$ ).

<sup>1</sup>LTM– Laboratory traditional smoking method; LOM- Laboratory oven dried method; CM- Commercial methods.