marathon (24h) conducted in more temperate conditions (0-20 °C) are presented.
Methods: ***Ad libitum*** food and fluid intakes of ultra-runners (MSUM $n = 74$, 24h $n = 25$) and controls (MSUM $n = 12$, 24h $n = 17$) were recorded throughout competition in real-time and analysed by dietary analysis software. Body mass and multi-frequency bioelectrical impedance were measured, and samples (blood, urine and saliva) were collected to determine pre- and post-running hydration status. Data were analysed by ANOVA with post hoc.
Results: Water intake through foods and fluids during MSUM and 24h was (mean) 732 mL/h and 378 mL/h, respectively. Post-running weight gain was evident (MSUM 26% and 24h 22%) in ultra-runners. Plasma osmolality (P_{Osmol}) remained within normal range throughout both events ($p > 0.05$ vs. control). Increases in plasma volume (P_V) and body water were evident in both events (P_V peak: MSUM 20.4%, $p < 0.001$; 24h 10.2%, $p < 0.05$). Urine osmolality (U_{Osmol}) increased and saliva flow rate decreased post-running in both events ($p < 0.001$). Increase in the U_{Osmol}:P_{Osmol} ratio above clinical reference range was evident at rest along the MSUM and post-running in both events ($p < 0.001$).
Conclusions: Taking into account evidence of hyperhydration in blood measures, using body mass change and urine measures of hydration to informing fluid replacement strategies during ultra-endurance events appear erroneous and likely to contribute towards clinically significance episodes of fluid-overload.
Funding source(s): N/A.

ASSESSMENT OF TRANS FATTY ACIDS IN FATS/OILS BEING USED BY *HALWAIS* FOR FRYING FOODS – A STUDY IN AN URBAN SLUM OF DELHI

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Background/Aims: The study aimed at estimating the *trans* fatty acid (TFA) content of fat/oil samples drawn during the process of commercial level frying.
Methods: The study comprising field work and laboratory analysis was carried out in an urban slum of Delhi. Using questionnaire-cum-interview schedule, data were gathered from 166 low income group women and 35 '*halwais*'. Fat/oil samples obtained from the '*halwais*' during the frying process ($n = 35$) were analysed for their TFA content using GLC.
Results: Majority of the women and the *halwais* were unaware of *vanaspati* (partially hydrogenated vegetable oils; PHVOs) being high in TFA; on the contrary, they considered the PHVOs an economical substitute of pure ghee. The fats/oils were subjected to prolonged/repeated heating at high temperatures. Laboratory analysis indicated TFA content of the samples to be < 5 g/100 g ($n = 14$; 40%); 5 to < 10 g/100 g ($n = 12$; 34.3%); 10 to < 15 g/100 g ($n = 4$; 11.4%) and as high as ≥ 15 g TFA/100 g ($n = 5$; 14.3%).
Conclusions: TFA content of the fats/oils being used for frying by the '*halwais*' (commercial level) catering to urban poor was rather high which has a bearing on health status of the concerned population. There is a dire need to educate the masses regarding adverse health effects of TFA as well as the measures to check fat/oil abuse during frying. Further, organizations like Food Safety and Standards Authority of India need to formulate effective policies, check TFA levels in PHVOs and impose necessary regulations to curb fat/oil abuse during frying.
Funding source(s): N/A.

EVALUATING MEAT QUALITY WITH BIOELECTRICAL IMPEDANCE SPECTROSCOPY

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Background/Aims: Muscle characteristics such as intramuscular fat and water content (WC) affect tenderness, juiciness and flavour of meat; characteristics that influence consumer choice when purchasing meat. Study aim was to investigate whether impedance characteristics of meat relate to the desirable consumer characteristic of juiciness (WC) of meat.
Methods: Fifty loin and topside meat samples were obtained from 25 ewes and 25 lambs at slaughter. Bioimpedance was measured in rectangular tissue blocks, approximately 100 g loin and 150 g topside. Tissue resistivities were calculated and used to predict tissue WC. Reference WC was measured by freeze drying.
Results: There were no significant differences in the measured water contents between ewes and lambs but the mean WC of loin samples was significantly ($P < 0.030$, paired *t*-test) lower than that of topside meat, 72.9 ± 2.1% and 73.3 ± 1.1% respectively. Bioimpedance measurements of tissue water were highly correlated with WC in both loin ($r = 0.91$, $p < 0.0001$) and topside ($r = 0.74$, $p < 0.0001$) but fat was poorly correlated ($r = 0.48$, $p < 0.007$). Split-sample analysis showed that bioimpedance could predict tissue WC with little bias (0.2% loin; 1.6% topside) but that 2 SD prediction limits were ± 17% for loin and ± 21% for topside.
Conclusions: Bioimpedance measurements of meat *post mortem* can provide an immediate measurement of water content although accuracy needs to be improved to provide if the method is to be of value in meat quality assessment.
Funding source(s): Australian Meat Processor Corporation, Meat & Livestock Australia; Victorian Department of Environment & Primary Industries.

MEASURING FAT DISTRIBUTION AND BODY COMPOSITION IN THE SHORT-BEAKED ECHIDNA (*TACHYGLOSSUS ACULEATUS*)

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Background/Aims: Changes in body fat may be a mediator for seasonal reproduction in the short-beaked echidna. In order to investigate we evaluated available techniques to assess body fat for suitability for use in the echidna.
Methods: Ten echidnas were examined by conventional trans-abdominal ultrasonography; 18 were examined using dual x-ray absorptiometery (DXA) and MRI was undertaken on 5 females. The general distribution of fat within both male and female echidnas was also examined by carcass dissection and proximate analysis ($n = 33$).
Results: Ultrasonography, while easy to perform, proved unsatisfactory as a method of fat analysis due to soft tissue imagery being impeded by quill growth. DXA provided total body fat-free mass (FFM) measurements that highly correlated ($r = 0.94$) with chemically-determined FFM and for fat ($r = 0.85$). Fat mass varied between 2.3% and 39.2% of bodyweight. Fat distribution was similarly defined by both dissection and MRI with fat located subcutaneously extending from the base of the skull dorsally to the base of the tail; the density of fat was greatest on the dorsal median plane. Intra-abdominal fat, associated with gonads and mesentery, was conspicuous only in highly conditioned animals.
Conclusions: These results reveal that echidnas can have a very wide range of body fat and it is possible to qualitatively and quantitatively determine body fat using MRI and DXA, both techniques being applicable to live animals but that ultrasound is not useful.
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THERMOGENIC RESPONSES TO MILD COLD EXPOSURE IN OVERWEIGHT AND OBESE INDIVIDUALS

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Background/Aims: Brown adipose tissue (BAT) has a role in human obesity. Cold exposure increases BAT mediated thermogenesis and could improve insulin sensitivity.
Methods: Twenty overweight or obese Australian adults of European origin, with a mean ± SD age of 59 ± 10.2 years and body fat of 38.8 ±