Conclusion and implications

When compared with traditional meta-analytical approaches, ABN demonstrates similar capacity to identify critical relationships/associations among data, with the added benefit of explaining greater proportions of observational variance, and providing a more systems-focused and holistic depiction of the relationships supported by the data. Future work applying ABN to meta-analytical datasets may help drive further innovation in leveraging this technique for literature summary activities.

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60. Water intake in hair lambs raised in tropical areas

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Introduction

Water is considered the most abundant and vital chemical substrate of all living beings and is a key nutrient that aids in temperature regulation, growth, digestion, metabolism, and excretion (NRC, 2007). Therefore, water is an essential component of animal production. Animals meet their water requirements from drinking, feeding, and metabolic water (ARC, 1980). Measured intakes of water are positively related to dry matter and energy intake. Voluntary water intake is an essential component of total water requirements in ruminants; however, only a few studies have evaluated this variable, particularly associated with metabolizable energy intake (MEI) in tropical conditions.

Table 1
Descriptive statistics of the data used to determine water intake for hair sheep

Item	N	Mean	SD[6]	Minimum	Maximum
BW, kg[1]	119	25.7	3.34	17.6	32.1
DMI, kg/d[2]	119	0.952	0.186	0.589	1.35
MEI, Mcal/d[3]	119	2.16	0.496	1.11	3.19
WI, kg/d[4]	119	2.25	1.25	0.589	5.26
THI[5]	119	77.9	1.69	75.4	79.6

[1] Body weight (BW).
[2] Dry matter intake (DMI).
[3] Metabolizable energy intake (MEI).
[4] Water intake (WI).
[5] Temperature-humidity index (THI; Kelly & Bond, 1971).
[6] Standard deviation (SD).

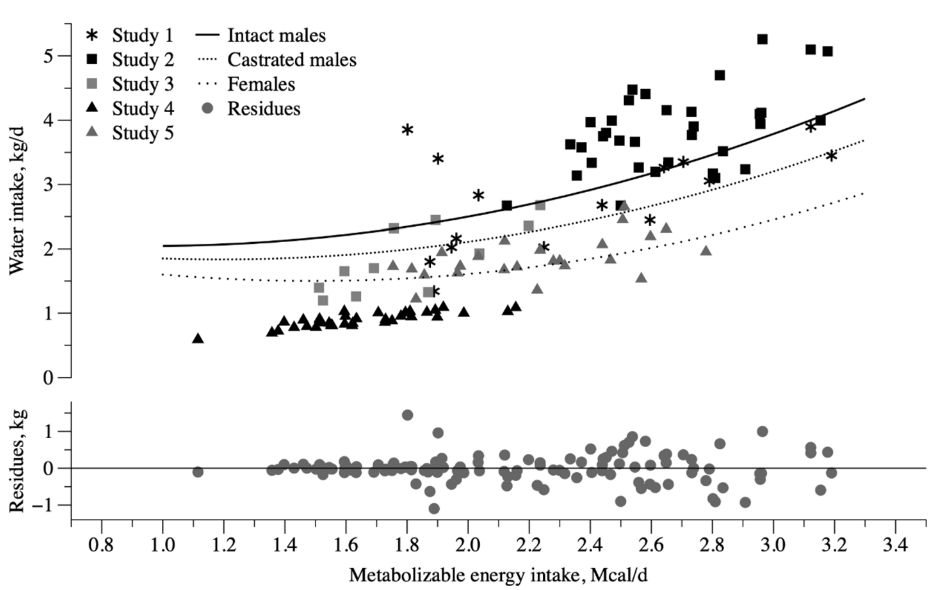

Fig. 1. Relationship between water and energy intake in hair sheep

Information on water intake is essential for herds to express their maximum potential. The objective of this study was to evaluate the water intake (WI) in hair sheep lamb raised in tropical areas.

Material and methods

The data were obtained from seven studies, for 161 observations; there were 3 sex of hair lambs (intact male, castrated, and female) raised in feedlot systems. The diets fed ranged from 87.4 to 93.2 % of dry matter (DM) and 2.77 to 2.97 Mcal/kg DM of ME. A descriptive analysis of the variables used in the study is provided in Table 1. Only studies that contained individual information were included and only date from ad libitum feeding was used. Normality and dispersion of residuals were checked, and we considered as influential points the records with studentized residuals greater than 2.5 and Cook's distance greater than 1. Thus, water intake data above 5.3 kg/d and two studies were removed from the dataset after cleaning, generating a new dataset with 119 observations. The water intake (kg/d) was estimated using a backward procedure including linear and quadratic components of MEI (Mcal/d), body weight (BW, kg), and temperature-humidity index (THI; Kelly & Bond, 1971). Parameters were removed from the model if P < 0.05, and the effect of sex was tested in all coefficients. As the dataset comprises different individual studies, we used a meta-analysis approach incorporating the study effect as a random effect.

Results and discussion

The slope was influenced by sex (P = 0.0064), generating three equations (Fig. 1, AIC = 150.8, R^2 = 0.149, MSE = 0.901): (1) Intact WI (kg/d) = $2.429_{(\pm\ 0.978)} - 0.799_{(\pm\ 0.780)} \times MEI + 0.417_{(\pm\ 0.170)} \times MEI^2$; (2) Castrated WI (kg/d) = $2.429_{(\pm\ 0.978)} - 0.994_{(\pm\ 0.790)} \times MEI + 0.417_{(\pm\ 0.170)} \times MEI^2$; (3) Female WI (kg/d) = $2.429_{(\pm\ 0.978)} - 1.244_{(\pm\ 0.807)} \times MEI + 0.417_{(\pm\ 0.170)} \times MEI^2$. The energy metabolism and water are closely related in mammals. Considerable differences in dry matter, energy, and water intake were found between animals raised in the tropics and temperate areas (Silanikove, 1989). Our results demonstrated that intact males have a greater water intake than castrated males and females. The NRC (2007) estimates 15% higher net energy requirements for maintenance for intact males than castrated males and females. This difference is partially due to the higher body protein of intact since this component is more metabolically active, thus requiring greater energy, which might be linked to the results found herein.

Conclusion and implications

Our model indicated that voluntary water intake was significantly linked to the ME intake and was affected by sex.

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61. Estimation of digestible organic matter intake through purine derivatives from sheep fed warm-season forages

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Introduction

Estimating feed intake of grazing animals has been a long-standing challenge. Dry matter intake is directly correlated with microbial protein synthesis (MPS), thereby allowing its estimation through the determination of purine derivatives (PD) excreted (Dórea et al., 2017). The PDC_{index} was developed to overcome difficulties in total urine collection, considering the weight of the animals and the PD:creatinine ratio in a given volume of urine (Makkar and Chen, 2004). Therefore, the objective of the study was to determine the relationship of DOMI and the PDC_{index} in sheep fed grass-based diets supplemented with warm-season legumes.

Material and methods

Data were collected from five different studies, all carried out in the Laboratory of Animal Nutrition of the Centre for Nuclear Energy in Agriculture (LANA/CENA/USP), in Piracicaba, SP, between 2013 and 2017. Fifty-five Santa Inês male sheep (Study 1: 25 ± 1.8 kg body weight [BW]; Study 2: 49 ± 7.0 kg; Study 3: 26 ± 5.9 kg; Study 4: 76 ± 8.2 kg; and Study 5: 61 ± 17.0 kg) were used as donors of urine for determination of PD. Each animal was allocated into metabolism cages for five consecutive days, preceded by 10 days of adaptation to diets and facilities. All animals were fed grass-based diets supplemented with warm-season legumes, twice a day (0800 h and 1600 h). Organic matter and DOMI were determined according to Lima et al. (2018). Urine was collected daily in plastic beakers containing sulfuric acid (10%) and analysed for purine derivatives, according to Makkar and Chen (2004), using a high-performance liquid chromatography system (Agi-