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Diet Diversity in Pastoral and Agro-pastoral Households in Ugandan Rangeland Ecosystems

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We explore how diet diversity differs with agricultural seasons and between households within pastoral and agro-pastoral livelihood systems, using variety of foods consumed as a less complex proxy indicator of food insecurity than benchmark indicators like anthropometry and serum nutrients. The study was in the central part of the rangelands in Uganda. Seventy nine households were monitored for three seasons, and eight food groups consumed during a 24 hour diet recall period used to create a household diet diversity score (HDDS). Mean HDDS was 3.2, varied significantly with gender, age, livelihood system and season ($p < .001$, $F = 15.04$), but not with household size or household head's education level. Agro-pastoralists exhibited lower mean diet diversity than pastoralists ($p < .01$, $F = 7.84$) and among agro-pastoralists,

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households headed by persons over 65 years were most vulnerable (mean HDDS 2.1). This exploratory study raises issues requiring further investigation to inform policies on nutrition security in the two communities.

KEYWORDS food insecurity, household diet diversity, livelihood system, pastoral, seasonal variation

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Food security that ensures a nutritionally adequate diet at all times is one of the determinants of nutrition security; while the consumption of foods, both in the quantity and quality sufficient to meet energy and nutrient requirements, is a basic measure of food utilisation (Babu and Prabuddha 2009). Food utilisation is one of the components of food security and has been described as the ability of humans to derive the full biological benefits from food, based on nutritional value, socio-cultural value, and food safety (Thompson, Berrang-Ford, and Ford 2010). Food utilisation is commonly assessed using benchmark or "gold standard" indicators like anthropometry, energy adequacy as well as serum vitamin A (retinol) and haemoglobin. Measuring household energy adequacy is quite complex, involving assessment of caloric intakes compared to recommendations, which depend on the individual household members, taking into account activity patterns.

The use of alternative indicators, based on criteria including the size of the expected benefits net of indicator data collection costs, has thus been proposed (Chung, Haddad, and Ramakri 1997). Their analysis suggested that the alternative indicators showing the strongest performance were related to the variety of foods consumed. Dietary indicators appeared more successful at identifying the food insecure than those suggested by the conventional poverty literature (e.g., household expenditures, demographics, landholdings, and caste). Assessing the variety of foods eaten by a household is therefore often used as a proxy indicator of the dietary quality component of food security (Coates et al. 2007; Hoddinott and Yohannes 2002; Kennedy, Ballard, and Dop 2011). Both the benchmark (nutrient based) and alternative (food variety) indicators can be derived from the same data collection module, a 24 hour dietary recall, but the amounts of data collected and the resources required for subsequent analysis differ (Chung et al. 1997). No clear superiority of any of the five dietary diversity indicators (i.e., scores of food groups, nutrient groups, nutrient dense food groups, unique food groups and unique nutrient dense food groups) has been found over the others in indicating dietary adequacy and caloric intake (Coates et al. 2007), meaning any can be a suitable indicator. Chung et al. (1997) mentioned a household dietary diversity score (HDDS) as an alternative indicator with a potential for monitoring changes in dietary energy

availability, particularly when resources are lacking for quantitative measurements. The HDDS is a generic indicator meaning it can be collected in a number of different settings, although interpretation is context specific (Chung et al. 1997). A study of 10 countries including Kenya found that increasing household dietary diversity significantly improved energy availability (Hoddinott and Yohannes 2002). In addition a review of developing country studies confirmed the positive strong association between diet diversity, nutrient adequacy and energy availability, suggesting that diet diversity could be a useful indicator of food security (Ruel 2004). A study in South Africa demonstrated a high correlation between mean adequacy ratio (MAR) of nutrients and dietary diversity scores (Steyn et al. 2005). An association between dietary diversity and nutrient adequacyhas been indicated (Arimond et al. 2010). A review of scientific evidence for use of the household dietary diversity score found an association between high household diet diversity and the probability of adequate micronutrient intake, and established that dietary diversity scores were valid proxy indicators for dietary energy availability at household level, as well as the micronutrient adequacy of diets of young children and women of reproductive age (Kennedy et al. 2011).

Our study opted to examine the seasonal variation in food utilisation, the dietary quality component of food security, by using a household dietary diversity score (HDDS). The study considered the research question "how does household dietary diversity differ between pastoral and agropastoral households and how does it differ in different seasons?"

METHODS

Study Area

The study area is located within two districts—Nakasongola and Nakaseke—in the central part of the cattle corridor of Uganda. Uganda is located in East Africa at latitudes of 2° S to 5° N, on the East African Plateau with a tropical climate moderated by its high altitude. The cattle corridor stretches through East Africa and in Uganda is a strip of rangelands with an estimated area of 84,000 sq km (43% of the country's total land area). It runs from the northeast (Moroto district) to the southwest (Mbarara district) and has a semiarid climate with relatively high average temperatures, ranging from 26.3 to 29.0° C but with extremes of 33.3 and 35.6° C in Mbarara and Moroto respectively. It is predominantly a pastoralist area, with relatively low and erratic rainfall ranging from a mean of 887 mm in the northeast to 905mm in the southwest; this is sufficient to support the growing of food crops for consumption in the area and neighbouring regions. The dominant soil types are sandy clay loams with heavier clay soils in the valley bottoms. The Ugandan cattle corridor is experiencing unusually long dry spells since

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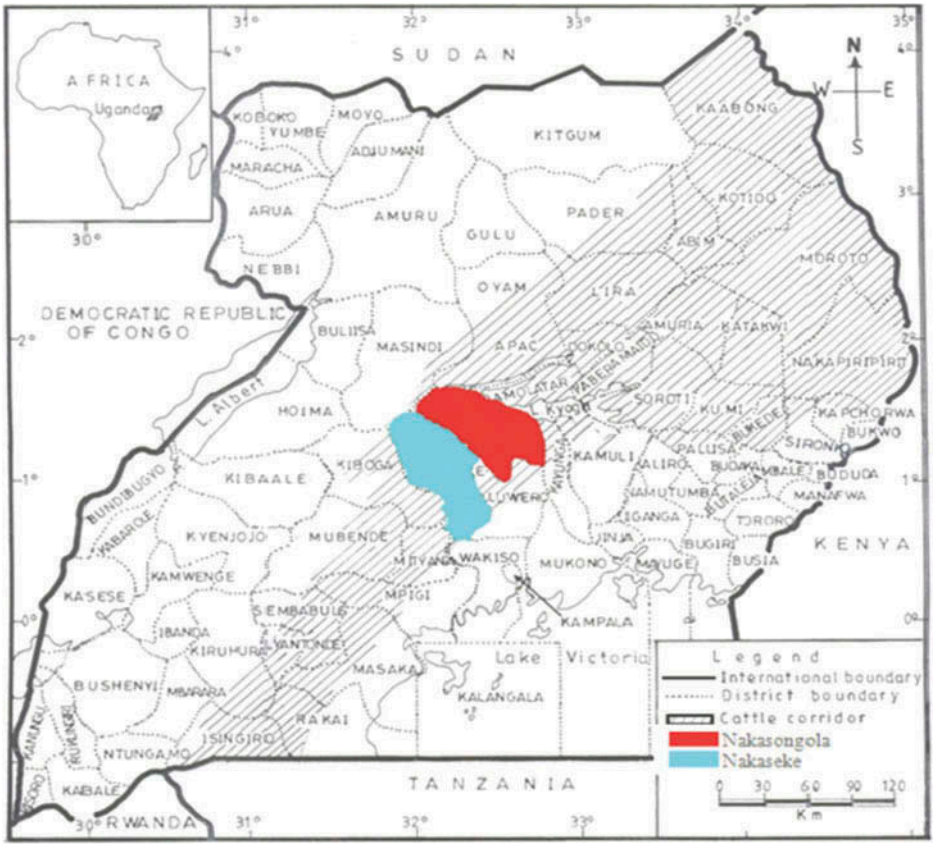

FIGURE 1 Map of Uganda Indicating Location of the Study Districts (Source: Uganda Government, Districts by 2007).

the prolonged and severe drought of 1999/2000. With grass withering, water sources drying and water volumes receding every year, soils are becoming increasingly unproductive, impacting on animal and agricultural production (NAPA 2007). Figure 1 shows a map of Uganda indicating the cattle corridor and highlighting the location of the study districts.

The study area is in a livelihood zone known as the central and southern cattle cassava maize zone which is made up largely of households that are unable to produce all of their annual food crop needs, so must buy food items to complement their own livestock and crop production (FEWSNET 2010). Under "normal" seasonal circumstances in Uganda, the major planting of biannual food crops (first season) ranges from late February to early March and sometimes up to April while the major harvest takes place from June to July. Second season planting is from late August to early September and sometimes up to October whereas harvesting occurs from December to February. However, the crop seasons may sometimes change depending on variations in climatic factors in single or consecutive years.

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Selection and Sampling of Respondents

Sampling and sample size was based on the sentinel site and minimalist approach to fit within available resources (Maxwell et al. 2003). The sample frame was 3600 households from 180 agropastoralist and pastoralist villages used in another study (Appendix 1). The sampling technique included stratification according to agro-pastoral or pastoral livelihood (two strata) and villages (21 and 7 strata respectively). The inclusion criteria for the pastoralist stratum was those having a livestock (cattle) extensive farming system and for the agropastoralist stratum was those with a mixed crop and livestock farming system. The villages were purposively selected to obtain a wide geographical spread over the study area then households randomly selected as the final sample units within these villages. The sample was thus 28 villages from which ten households were randomly sampled per village to give a sample size of 280 households.

Design of the Study

This study was an exploratory, cross-sectional analysis of household diet diversity done on one day in each of three seasons (growing, harvest and planting), in the period 2011–2013. Household interviews were held first on one day in 2011 and the same households were interviewed again on one day in 2012 and subsequently on one day in 2013; by the end of the data collection period each household had been visited three times. In order to capture any seasonal variation, timing of data collection corresponded to the agricultural seasons of biannual food crops—particularly maize—in the region. The first round in November 2011 corresponded to the middle of the second growing season (second rains), planting having been completed in early September. The second round in July 2012 corresponded to the major harvest (start of first dry season) and the third round in February 2013 to the major planting season—start of the first rainy season.

Household Survey

The instrument was a pretested, interviewer administered, structured questionnaire with both open and close ended questions. The questionnaire had a section to capture basic household demography and in the first two rounds of data collection each household was geo-referenced using a hand-held Global Positioning System (GPS). The coordinates were taken in the WGS 84 geographical coordinate system in decimal degrees and the level of accuracy of a household location was taken at three meters. In the third round the pre-recorded geo-references were used to trace and follow up only those households that were previously involved.

This study considered a household to be a person or a closed localised group of people who live together in the same house or compound, share

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some resources or activities and are catered for as one unit (O'Laughlin 1999). The research assistants were asked to explain this to every respondent, at the start of inquiry on the household's demography and food intake.

Inter-observer bias was reduced by engaging research assistants (interviewers) in a methodological workshop prior to the start of the study. To ensure uniformity among research assistants in the interview process, the workshop sessions emphasised interpretation and translation of questions in the standardised questionnaire, as well as the approach and style of probing respondents for detail without leading them to answers. We selected only four (two female, two male) research assistants familiar with the study area and local language, a suitable number to minimise inter-observer differences while ensuring coverage of the sample households within the shortest time possible given the wide distances and geographical area to be covered. The questionnaire consisted mainly of precisely worded closed questions not allowing much room for interviewer variability or error in responses and it was pretested on a representative group within the study area. Each research assistant was observed and guided through this pre-test process. A review of the pre-test questionnaires and a retraining session was held for the interviewers for reinforcement and correction of observed shortfalls.

To minimize intra-observer bias, stringent use of the multiple pass method to help respondents remember all foods consumed throughout different times of the day was emphasised within each round of data collection; and at each round the research assistants did not interview the same households as in the previous round.

Measurement of Dietary Intake

The questionnaire assessed food intake based on a 24-hour diet recall of foods eaten in the household at five different times: morning (6–10 a.m.); mid-morning (10 a.m.–12 p.m.); afternoon (12–5 p.m.); evening (5–8 p.m.) and night (8 p.m.–6 a.m.) using the multiple pass method (Raper et al. 2004). As part of the prompting process to ensure no foods were forgotten, a list of 33 food items was referred to. The respondents were mostly the female household members concerned with food preparation but male respondents participated in 28% of the interviews in the three rounds.

Ethical Considerations

Ethical clearance was sought from the Uganda National Council for Science and Technology, (UNCST). No respondent was interviewed as a participant in the survey without prior notice and signature on a written consent form (Appendix 2).

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Data Management

While dietary diversity is inconsistently defined by different researchers (Foote et al. 2004), the selection of scoring systems, cut-off points, and reference periods should ensure the validity and reliability of the diversity indicators for the specific purposes for which they are used (Ruel 2004). The current study used a 24 hour reference period and a food group as the unit to count towards total diet variety. Thus in calculating the HDDS, diet diversity was defined as the number of food group varieties reported in the 24 hour dietary recall process. The food items from the dietary recall were assigned to eight food groups based on guidelines from FAO (Kennedy et al. 2011) and a food composition table for central and eastern Uganda (Hotz et al. 2012). The coding into food groups was done solely by the lead author to ensure reliable and valid output. A double data entry system was used to capture data which was validated using Stata 12 software. On completion of data entry, it was noted that not all sampled households were consistently followed up, thus to ensure full representation of the three seasons, this study selected 79 households that were reliably present in all three surveys. The eight food groups selected were: (1) Starchy Roots and Tubers; (2) Grain Legumes; (3) Wild/Uncommon Indigenous Foods; (4) Cereals, Grains, and Products; (5) Meat, Poultry, and Eggs; (6) Leafy and Other Vegetables; (7) Milk and Milk Products; and (8) Oils and Fats.

Statistical Analysis

Data were analysed using Excel and R-Statistical, and while differences at $p < .05$ were considered significant for all tests, those at $p < .01$ were highly significant. The variation in HDDS was checked against season and household parameters including livelihood system, land tenure, household size as well as household head's education level, ethnicity, age, and gender. The χ^2 test was used to check for independence and significance of frequency distribution of HDDS, while Fisher's exact test was used for smaller samples where data had been disaggregated. ANOVA was used to check for significant differences between HDDS means, normal Q-Q plots were generated to check the distribution of the data and fitted value plots used to examine residuals and identify outliers. A mixed effects model was used to assess how well season (the basis of three repeated measurements) explained variability in the HDDS.

RESULTS

The modal HDDS was 3.7 over the three seasons, the mean was 3.2, minimum 1.7 and maximum 4.7 (sd = *0.68, n = 79*). The mean HDDS did not vary significantly with HH size, land tenure or education level of HH

TABLE 1 Average HDDS by Selected Household Parameters, $n = 79$

Household (HH) parameters	Category	n	Average HDDS (of 8 food groups, for 3 seasons)	Significance (ANOVA)		
				F	df	p
Livelihood system	Agro-pastoral	59	3.1 ± 0.08	7.84	1,77	<.01
	Pastoral	20	3.6 ± 0.14			
HH head gender	Female	13	2.8 ± 0.18	4.85	1,77	.03
	Male	66	3.3 ± 0.08			
HH head age group (years)	16–25	3	3.1 ± 0.37	3.27	3,74	.03
	26–45	32	3.4 ± 0.11			
	46–65	29	3.2 ± 0.12			
	> 65	15	2.7 ± 0.16			
HH head ethnicity	Munyankore	11	3.7 ± 0.19	3.51	6,72	<.01
	Muganda	34	3.3 ± 0.11			
	South-western[a]	3	3.3 ± 0.36			
	Muruuli	19	3.1 ± 0.14			
	Northern[b]	1	2.7 ± 0.62			
	Migrants[c]	10	2.6 ± 0.2			
	Mukiga	1	2.3 ± 0.62			

Note. Ethnic groups: [a]Munyoro, Mutoro, Mufumbira; [b]Jaluwo, Langi, Lugbar; [c]Rwanda, Burundi, Tanzania.

head, but it varied with livelihood system and other household parameters as indicated in Table 1.

Effect of Livelihood System on HDDS

Although mean HDDS varied independently by HH head age, gender and ethnicity, on consideration within livelihood systems it only varied with gender among pastoral households ($p < .01$; $F = 7.90$; $df = 1,75$), as illustrated in Figure 2.

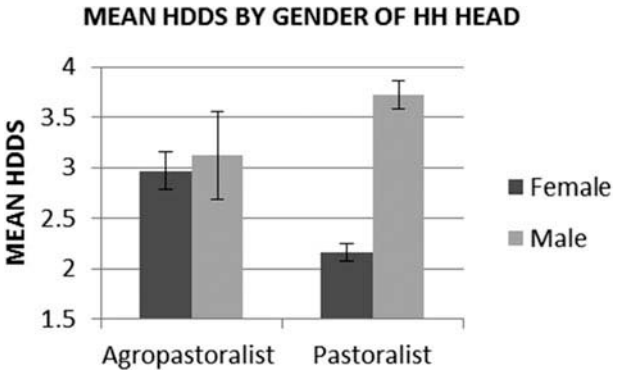

FIGURE 2 Average HDDS by gender of HH head. Columns show female and male headed households; error bars show standard error.

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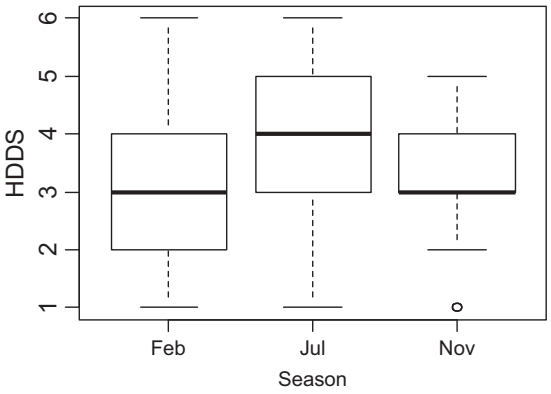

FIGURE 3 HDDS by season; February was major planting in 2013, July was major harvest in 2012, and November was second growing season in 2011. Bold horizontal bars in the box show the mean, while dotted lines represent the minimum and maximum values.

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Effect of Season on HDDS

As illustrated in Figure 3, the variation between the HDDS means by season was quite significant ($p < .001$; $F = 15.04$; $df = 2{,}234$) with the major planting season in February 2013 having the lowest score (2.8). A two-way ANOVA showed no significant difference ($p = 0.09$, $F = 2.38$; $df = 2{,}231$) in variation of HDDS in different seasons between pastoral and agropastoral households.

HDDS varied with gender of HH head particularly in the second growing season ($p < .01$, $F = 8.98$; $df = 1{,}75$) and with age of HH head particularly in the major planting season ($p < .01$; $F = 5.56$; $df = 3{,}70$). For agro-pastoral communities, HDDS was lowest for those households headed by persons older than 65 years (mean 2.1, SE 0.33) while among pastoral communities it was lowest in households headed by persons between 26–45 years of age (mean 2.9; SE 0.37).

Seasonal Dietary Profiles of Households with Low Diet Diversity

Among those food groups not regularly consumed were "meat, poultry and eggs," "leafy and other vegetables," as well as "oils and fats," as detailed in Table 2.

Consumption of "foods gathered wild" took place mainly during the growing season and even then only by 39%–55% households from the pastoral and agro-pastoral livelihood systems respectively.

Based on a diet diversity score of four as the best indicator of a Mean Adequacy Ratio (MAR) of less than 50% (Steyn et al. 2005), this study considered households with a HDDS of less than four as most at risk of nutrient inadequacy. In general, diets were dominated by four food groups and for

TABLE 2 Scarcely Consumed Food Groups

Food group	Livelihood	Proportion of households (%) not consuming FG – by season		
		Planting	Harvest	Growing
Meat, poultry and eggs	Pastoral	90	90	100
	Agro-pastoral	97	58	88.1
Leafy and other vegetables	Pastoral	85	70	90
	Agro-pastoral	76	64	86
Oils and fats	Pastoral	65	45	100
	Agro-pastoral	98	93	100

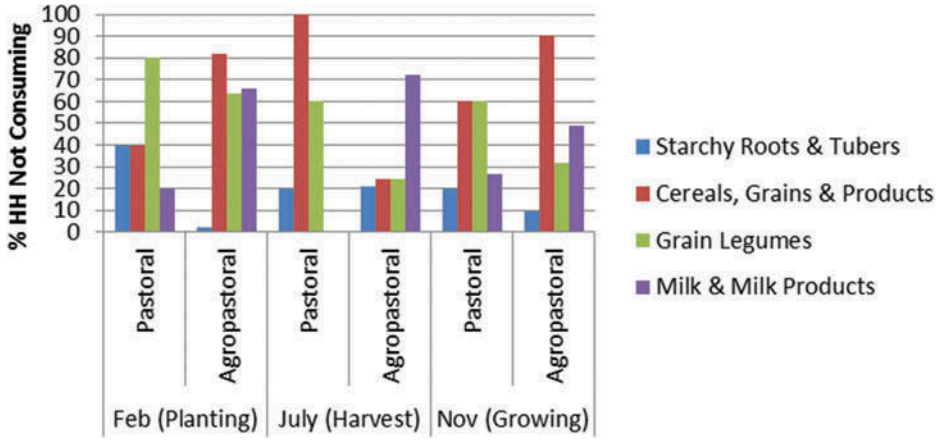

FIGURE 4 Seasonal trends in proportion of HH with HDDS < 4 which did not consume dominant food groups. Columns show food groups by livelihood system and season.

those households with diet diversity of less than four, non-consumption from these food groups varied with season and livelihood group as illustrated in Figure 4.

While 50%–70% of agro-pastoral households with HDDS below 4 did not consume "milk and milk products," 60%–80% pastoral ones did not consume grain legumes over the three seasons.

DISCUSSION

As called for by Webb and Lapping (2002), this study identified overlapping indicators of vulnerability to low dietary diversity and thus nutritional deficiency. Livelihood system was one such indicator and agro-pastoral households exhibited lower HDDS than pastoral ones.

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Longitudinal data collection provides the opportunity in a rural, agriculture-based community to explore seasonal differences in dietary patterns, the common lack of which leads to an incomplete assessment of usual diet (Kennedy et al. 2010). The current study kept this in mind and demonstrated that the planting season was the period of lowest diet diversity, thus strengthening the view that rural diet diversity in Uganda is tied to harvest patterns and local availability (Shively and Hao 2012). Our study demonstrated that during the planting season, age presented the major risk factor, withhouseholds headed by elderly agro-pastoralists being most vulnerable. Although Webb and Lapping (2002) observed that women heads tend to sustain food consumption of their families whatever else has to be sacrificed along the way, the current study found a lower overall variety of foods particularly among female-headed households in pastoralist communities. This was especially pronounced during the growing season, thus indicating a higher risk of nutrient inadequacy in female headed households in pastoral communities. This study's findings on elderly and female headed household vulnerability can act as a useful reference in informing implementation of the Uganda Food and Nutrition Policy (UFNP) which has as one of its guiding principles the necessity to ensure that gender considerations and the needs of all vulnerable groups are integral to all components of the policy (GOU 2003).

The fact that household diet diversity was not affected by the number of household members is in accord with a study in south India which found that household size and dependency ratio did not perform well as an alternative indicator of food security (Chung et al. 1997). Household wealth indicators were not used in the current study since it was exploratory, to set a basis for future in-depth research, and authors were aware of studies that established strong associations between dietary diversity and some indicators of household socioeconomic status in urban and rural areas and across seasons in developing countries similar to Uganda (Hoddinot and Yohannes 2002; Ruel 2003), using more elaborate instruments and analyses than those used in this case.

Non-consumption from the "meat, poultry and eggs" food group left a large number of households at possible risk of inadequate haem iron and other nutrients in all seasons. In agro-pastoral households such non-consumption increased from 58% in the harvest to 97% in the planting season, while in pastoral households it varied from 90%–100% irrespective of season. The fact that pastoralists keep livestock but hardly consume meat relates to the tendency of such households to view livestock as having value in the realms of savings, buffering, insurance, and social integration, rather than consumption (Stroebel, Swanepoel, and Pell 2011). However, personal knowledge about the pastoral community studied is that they do slaughter small stock for consumption on an irregular basis and meat consumption is lumpy in case of special occasions, which situation may not have been

captured during the 24 hour dietary recalls. In fact during the July 2012 survey as part of this study, one male household head in Kamusenene B village, Nakaseke District said: "we can slaughter a sheep or goat at any time not only during food insecure times".

Surveyed households did not consume from the oils and fats food group, with the exception of pastoral communities where 35% and 55% of households consumed ghee (a food item in the group) during the planting and harvest seasons, respectively. Such low dietary intake of fats and oils could be due to cost implications as noted for sub-Saharan Africa (Oniang, Mutuku, and Malaba 2003). Households would thus have been reliant on other food groups to provide an alternative source of fat over the seasons.

Particularly during the growing season when about half of households consumed from the "foods gathered wild" group, this could be a major source of the nutrients likely to be lacking due to non-consumption from other food groups. Such a finding supports the proposal that this source of nutrition deserves greater attention in food and agricultural programming (Grivetti and Ogle 2000). However, the food items in the "foods gathered wild" group ranged from leafy vegetables and wild game to fibre and nutrient-rich foods from the wild, resulting in greater diversity in possible nutrients. This strengthens the recommendation that the treatment of wild or 'famine' foods in construction of diet diversity measures bears further exploration, given the somewhat inconsistent relationship of this diet component with indicators of food security and hardship (Coates et al. 2007). Uganda's Agricultural Sector Development Strategy and Investment Plan 2010 intends to promote strategic enterprises with priorities based on zoning (MAFAP 2013). This study's observation on consumption patterns by the livelihood groups—including non-consumption of meat and milk products common for agro-pastoralists and non-consumption of grain legumes common for pastoralists—can feed into the selection process of strategic enterprises suitable for this region in order to enhance diet diversity. For example while beef cattle, goats and poultry could be promoted for both livelihood groups, dairy cattle could be promoted to increase availability of milk for agro-pastoralists to discourage them from dropping milk products from their diets; grain legumes like beans could be promoted to increase availability to pastoralists and enhance their uptake of crop based food items.

The failure to reach all targeted households through all seasons, reducing the effective sample size for these analyses, was a major limitation. Although target respondents were a female member of the household who was responsible for preparing and serving food, when these were away, male respondents were involved—which could have resulted in some diet recall bias. However any possible bias was minimised by the prior training of research assistants about the importance of interviewing a male respondent who was available at home fulltime. Reliability of the data could have been reduced by the fact that although the household was the same for each of

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the three rounds of data collection, in some cases the respondent was not the same person and the sex of the respondent differed. However, validity of the data was enhanced in that during the three rounds of survey, at the end of each field day, the questionnaires were examined by the lead author and clarification about responses was sought from the relevant interviewer, which gave an opportunity for continuous supervision and guidance throughout the process to ensure good quality of the data collected. When data had to be disaggregated for some household parameters particularly gender, ethnicity and age of household head, the subgroup numbers were even smaller thus lowering precision and increasing the risk that some actual differences were reported as non-significant.

By providing information on dietary diversity at three points in time, this study contributes to knowledge on patterns of seasonal variation. Such information enables a better understanding of the effect of both normal seasonal variation and shocks on dietary consumption (Kennedy et al. 2010); and can be applied in efforts to decrease nutritional threat (Messer 1989). The disaggregation of the study sample based on different parameters enabled identification of those categories of vulnerable households which could easily be missed out by being lumped into a larger group (in this case households headed by female pastoralists and elderly agro-pastoralists). Such information could be useful for guiding implementation of a larger study in which the target community would be stratified at the start and enough numbers assessed per household parameter of interest to enable identification of the most disadvantaged households. One of the key areas of focus of the UFNP is food and nutrition surveillance whose aim is to strengthen early warning systems, providing timely information on food and nutrition for rational decision-making at all levels (GOU 2003). Output from this study can be used by policy makers as a reference during the process of obtaining early warning and timely information to target nutrition security interventions and related social support. Given that Schmidhuber and Tubiello (2007) have noted existing global assessments of food security and climate change as only focusing on the impacts on food availability and access, without quantifying the interaction of food and nutrition effects, the current study's insight into seasonal variation provides scope for use of diet diversity-based methodologies in studies of climate variability and climate change.

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CONCLUSIONS

In this exploratory study diversity of diets in the central part of the cattle corridor of Uganda (a rangeland ecosystem), as measured by a household dietary diversity score, has demonstrated significant variation with season and between pastoral and agro-pastoral livelihood groups—the former

generally having higher diet diversity. Female-headed households within the pastoral group appeared to be at particularly high risk of nutrient inadequacy as a consequence of low diet diversity. Non-consumption of meat and milk products was common for agro-pastoralists but the same was true for grain legumes in case of pastoralist communities. This put most households at risk of nutritional deficiency particularly in the planting season. Wild foods may play a critical role in nutrition and food security given the higher proportion of households consuming them particularly in the growing season. Given that research, for example covering food consumption and food habits, is one of the focus areas of the UNFP, the findings from the current study provide a basis for an indepth longitudinal survey to reveal the association between gender, age, ethnicity, season and diet diversity in pastoral and agro-pastoral communities. Resulting information could then be used to provide local solutions to food and diet diversity issues.

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APPENDIX 1
SAMPLING FOR A BASELINE SURVEY IN STUDY AREA

The baseline survey from which this study borrowed its sampling frame was done in Nakasongola and Nakaseke districts in 2011 by a Ugandan based organisation, Africa Innovations Institute (AfrII), as part of an IDRC funded project on adaptation to climate change (AfrII 2011). The districts were stratified into three farming systems pastoral-majority areas, areas of extensive grazing by mixed crop-livestock-producers and crop farming areas. Using the registers at the parish local council chairpersons' offices as the sampling frame, 30 villages were randomly selected from each of the three strata per district ($2 \times 3 \times 30$) to give a total of 180 villages. Then using registers at village local council chairmen's offices, 20 households were randomly selected in each of the sampled villages (20×180), making a total sample of 3,600 households.

APPENDIX II
HOUSEHOLD CONSENT FORM

Study: Vulnerability of Food Security to Climate Variability in Pastoral and Agro-pastoral Communities in the Cattle Corridor of Uganda

My Name is . . . . . I have been engaged as part of the investigating team conducting a study to assess how vulnerable food security is to variation in climatic factors. We are also investigating coping mechanisms, adaptive capacity and adaptation strategies in pastoral and agro-pastoral communities to ensure household food security in Nakasongola and Nakaseke Districts.

Purpose for Consent

Your HH has been selected as part of a representative random sample and we are seeking your permission to:

1. Respond to the questions we shall ask which will help us understand the state of food security as partly shown by food intake and access; as well as the factors that make HHs vulnerable to food insecurity.
2. Take anthropometric measurements of children and an adult in your household as one of the measures of nutritional and health state of people.
3. Take blood and other samples as well as physically examine selected household members where deemed necessary.
4. Return to your household every after three months to follow up issues related to this study.

Confidentiality

To ensure confidentiality, unique identifiers have been used thus your name will not appear. Whatever information you provide to us will remain confidential and will be accessed by only Senior Staff involved in the study.

There are neither risks nor benefits related to your consent, participation of households is voluntary and you are free to decline or stop at any stage of the study should you feel uncomfortable, however your involvement is very much treasured and we rely on you to provide us with accurate information.

The purpose of this study is to help us advise government and key stakeholders on the effects of climate variability on food and health security, as well as the resultant vulnerabilities of HHs within the community and how best they can be addressed.

Signed Consent

I have been fully explained about the study and understood its purpose and objectives. I understand the details and have been informed about the requirements and hereby agree to participate in the study.

I . . . . . **agree to participate in this study.**

Signature/Thumb Print . . . . . .
Date: . . . . . .

Name of person obtaining the consent . . . . . .
Signature . . . . . .

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