**Metadata – CSV column names, units and descriptions**

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**Title:** Predicting spatial-temporal patterns of diet quality and large herbivore performance in semiarid rangelands using satellite time series

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Metadata for fecal quality data (Kearney\_etal2021\_Patterns\_of\_herbivore\_Data\_FQ\_cln.csv)

|  |  |  |
| --- | --- | --- |
| **Column header** | **Units** | **Description** |
| uID | N/A | Unique identifier of individual data point |
| year | N/A | Year of sampling |
| week\_of\_grazing\_season | N/A | week within the summer grazing season (approximately May 15 – Oct 15) |
| CP | % | Crude protein measured from fecal samples at pasture scale using NIRS |
| DOM | % | Digestible organic matter measured from fecal samples at pasture scale using NIRS |
| sampling\_date | date | Date of fecal sampling |
| pastureID | N/A | Unique identifier of pasture |
| weeks\_in\_pasture | N/A | Number of weeks cattle had been in pasture on sampling date |
| area\_ha | ha | Area of the pasture in hectares (ha) |
| rAPAR | MJ m-2 day-1 | Raw APAR on the sample date |
| dAPAR | MJ m-2 day-1 | APAR differential (slope) average of the 30-days prior to sampling date |
| tPeak | days | Days since peak instantaneous rate of greenup (IGR) |
| iAPAR | MJ m-2 day-1 | Cumulative (integrated) APAR up to the sampling date |
| iAPAR-dry | MJ m-2 day-1 | Cumulative (integrated) decreases in APAR relative to previous peak |
| stock\_count | individuals | Number of cattle stocked in the pasture |
| stock\_rate | cattle ha-1 | Number cattle stocked per hectare in the pasture |
| day\_of\_year | days | Days since January 1 of the current year |
| period | N/A | Which 28-day sampling period of the grazing season (used for stratification) |

Metadata for monthly average daily gain (ADG) data (Kearney\_etal2021\_Patterns\_of\_herbivore\_Data\_ADG\_monthly\_cln.csv)

|  |  |  |
| --- | --- | --- |
| **Column header** | **Units** | **Description** |
| uID | N/A | Unique identifier of individual data point |
| pastureID | N/A | Unique identifier of pasture |
| on\_date | date | Start date of the weight gain sampling period |
| off\_date | date | End date of the weight gain sampling period |
| ADG | kg day-1 | Mean of average daily weight gain (kg) of all cattle in the pasture over the sample period |
| ADG\_sd | kg day-1 | Standard deviation of average daily weight gain (kg) of all cattle in the pasture over the sample period |
| CP\_pred | % | Predicted crude protein (%) for the pasture from satellite-based model (this study) |
| DOM\_pred | % | Predicted digestible organic matter (%) for the pasture from satellite-based model (this study) |
| ANHP\_pred | kg ha-1 | Predicted aboveground net herbaceous productivity (ANHP) from satellite-based model (Gaffney et al., 2017) |
| stock\_count | individuals | Number of cattle stocked in the pasture |
| stock\_rate | cattle ha-1 | Number cattle stocked per hectare in the pasture |
| days\_on | days | Number of days cattle have been in the pasture at the end of the weight gain sampling period |
| AU\_ha | animal units ha-1 | Number of animal units (1000 lb. animal equivalent) per hectare stocked in the pasture, based on the average weight of the cattle during the weight gain sampling period |
| on\_weight | kg | Mean weight of cattle in the pasture at the beginning of the sampling period (“on\_date”) |
| off\_weight | kg | Mean weight of cattle in the pasture at the end of the sampling period (“off\_date”) |
| rAPAR | MJ m-2 day-1 | Raw APAR on the sample date |
| dAPAR | MJ m-2 day-1 | APAR differential (slope) average of the 30-days prior to sampling date |
| tPeak | days | Days since peak instantaneous rate of greenup (IGR) |
| iAPAR | MJ m-2 day-1 | Cumulative (integrated) APAR up to the sampling date |
| iAPAR-dry | MJ m-2 day-1 | Cumulative (integrated) decreases in APAR relative to previous peak |
| area\_ha | ha | Area of the pasture in hectares (ha) |
| day\_of\_year | days | Days since January 1 of the current year |
| period | N/A | Which 28-day sampling period of the grazing season (used for stratification) |
| n | individuals | Number of cattle weighed during the sample period (mean of which is used to calculate “on\_weight” and “off\_weight”) |

Seasonal average daily gain (ADG) data (Kearney\_etal2021\_Patterns\_of\_herbivore\_Data\_ADG\_seasonal\_cln.csv)

|  |  |  |
| --- | --- | --- |
| **Column header** | **Units** | **Description** |
| uID | N/A | Unique identifier of individual data point |
| pastureID | N/A | Unique identifier of pasture |
| year | N/A | Year of sampling |
| ADG\_obs | kg day-1 | Mean of observed average daily weight gain (kg) of all cattle in the pasture over the sample period |
| on\_weight | kg | Mean weight of cattle in the pasture at the beginning of the grazing season |
| off\_weight | kg | Mean weight of cattle in the pasture at the end of the grazing season |
| ADG\_pred | kg day-1 | Mean of model-predicted average daily weight gain (kg) of all cattle in the pasture over the sample period |
| sand\_pct | % | Mean percent sand in surface soil (0 – 20 cm) of the pasture, derived from POLARIS data |
| iAPAR\_seas | MJ m-2 day-1 | Cumulative (integrated) APAR from the start of the growing season to the end of the grazing season (used to calculate “ANHP\_seas\_pred”) |
| ANHP\_seas\_pred | kg ha-1 | Aboveground net herbaceous productivity for the pasture at the end of the grazing season |
| off\_weight\_pred | kg | Model-predicted mean cattle weight in the pasture at the end of the grazing season |