**DOI:** 10.1002/0000.12345

# **RESEARCH ARTICLE**

#### ISSN:0000-000X



On-farm phenotypic characterization of Shwe Ni and Pyar Zein in Salin and Pakokku Township

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# Abstract

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Email: drayeayemaw@uvsyezin.edu.mm The research was conducted to determine the phenotypic characterizations in two indigenous cattle breeds: Shwe Ni and Pyar Zein from central dry zone. A qualitative and quantitative measures were taken in 248 heads of over two- year aged indigenous cattle, 67 males and 57 females of Shwe Ni and 67 male and 57 females of Pvar Zein. The predominant qualitative differences between the two breeds were observed as not-pigmented red eyelid, red muzzle colour, and notpigmented red hoof colour in Shwe Ni, whereas in Pyar Zein they were found to be pigmented black eyelid, black muzzle colour, and notpigmented black hoof colour. Quantitative phenotypic variants such as body length, heart girth, horn length and muzzle circumference (cm) are 115.65±1.01, 180.31±1.36, 17.71±0.57 and 45.46 ±0.31 in male Pyar Zein which were significantly longer than those of male Shwe Ni having 112.47±1.37, 176.69±2.57, 9.30±0.76 and 44.63±0.53(P < 0.05). But male Shwe Ni showed significantly greater in ear length, face length and dewlap width than male Pyar Zein (24.69± 0.37 & 23.65±0.28, 53.73±0.42 & 52.16±0.42, 22.77±0.61 & 20.00±0.44) at P < 0.05. Among female animals, Shwe Ni is significantly longer in body length (103.15±1 & 96.48±0.79), heart girth (144.48±1.99 & 131.48±1.20) height at withers (125.87±1.29 & 118.80±1.16), ear length (24.21±0.34 & 19.39±0.42), face length (48.08±2.27 & 42.32±0.75), neck length (28.52±0.34 & 23.32±0.43), dewlap width (18.33±0.68 & 11.03±0.53), pelvic width (37.48±0.50 & 33.58±0.66), teat length (3.34±0.18 & 3.03±0.17) and tail length (3.03±0.17 & 88.58±0.68) than Pyar Zein (P < 0.05). This study revealed distinct phenotypic variations between two indigenous cattle breeds regarding their qualitative and quantitative traits.

### **Keywords:**

Phenotypic characterization, qualitative, quantitative, Shwe Ni, Pyar Zein

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#### MJJVAS Myanmar Journal of Veterinary and Animal Sciences

#### 1. Introduction

Being a developing country, cattle are integral part of the agriculture economy in Myanmar and provide almost all the draught power and rural transport. Therefore, raising of draught cattle by farming families is a significant livestock industry in Myanmar. They are raised under multiple purposes, such as land preparation for cropping, utilizing the manure as natural fertilizer, and producing beef for human consumption. The whole cattle populations are over 9.75 million whereas draught cattle are over 9.6 million and dairy cattle are near 0.13 million (LBVD, 2018). The majority of farmers owned a herd size of 30-50 cattle consisting male and female calves, heifer, breeding cow in every village tract.

The important breeds of Myanmar cattle are Shwe Ni, Pyar Zein and other non-description breeds. There were no official historic records of the origin of Myanmar indigenous cattle and generally they can be divided into four groups depending on coat color; Nwa Ni group, Nwa Pyar group, Nwa Net group and Nwa Phyu group (Sar-u) (Aung Soe,1994).

Shwe Ni, mostly red or pied in colour, is the true indigenous Myanmar cattle (Figure 1a and 1b). The dewlap is large in the bull and small in the cow. Broad chest, straight back and round rib cage are prominent characteristics. Shwe Ni is moderately small, compact and with fine bones. It is raised on multiple purposes, including land preparation for cropping and human consumption. (Aung Soe, 1994)

Pyar Zein are regarded as cross-bred cattle which were derived from breeding between Indian and local breeds many decades ago. After many years of selection, it has become as present type. It is named after the coat color, which means bluish white (Figure 2a and 2b). It has become the most popular breed in Myanmar. It is kept for draught power as well as for dairy purpose. Shwe Ni cows are poor milkers whereas Pyar Zein show some dairy traits (Country Report, 2001).

The basic features of draught cattle production depend on the rain, irrigation and plantation area within the country. Rotational grazing on paddy field after harvesting and cut-and-carry system for draught cattle is commonly practiced for local cattle in rural area. The most important traditional sources of feed for draught animals are natural pasture and fodder because they possess ability to better utilize the limited and poorquality feed resources (National Consultative Committee, 2004). In addition, indigenous cattle have ability to adapt harsh climatic condition and tolerance to a range of diseases (Dereje and Kefelegn,2016). However little attention is given to identify, characterize and conserve these biologically superior animal genetic resources in the country.

Genetic characterization based on molecular assessment is reported to be the most used method for evaluation of genetic diversity among and within livestock breeds, but it needs high technology and financial support. Researchers have used a characterization method based on morphological traits that are easy to measure, low cost and provide valuable information (Eskindir et al., 2013). The information provided by characterization studies is essential for planning the management of animal genetic resources (AnGR) at local, national, regional and global levels. The Global Plan of Action for Animal Genetic Resources recognizes that a good understanding of breed characteristics is necessary to guide decision-making in livestock development and breeding programs (FAO, 2012). Furthermore, there are variations in body dimensions of farm animals according to type of breed and one common way of differentiating breeds is to evaluate their morphological structural characteristics (Metta et al., 2004).





Fig. 1. (a) Male Shwe Ni and (b) Female Shwe Ni



Fig. 2. (a) Male Pyar Zein and (b) Female Pyar Zein

Therefore, on-farm phenotypic characterization of Shwe Ni and Pyar Zein based on observable characteristics were studied to identify phenotypic characteristics of Shwe Ni and Pyar Zein cattle and to examine between breed diversity in Shwe Ni and Pyar Zein cattle. The present study provides an aid for optimizing the conservation and utilization strategies necessary for local animal genetic resources.

#### 2. Materials and methods

#### 2.1 Description of the study areas

#### 2.1.1 Salin Township

Salin is on the western bank of the Irrawaddy River and is 50 miles away from the capital of Magway (Figure 3). It is in Minbu District of Magway Region; central dry zone of Myanmar above sea level 216.186 feet and coordinates 20°34′38″N, 94°39′34″E. It is a dry land with drought and hot climate. The mean annual temperature of the township ranges 30°C to 47°C between whereas the mean annual rain fall may reach to 12 inches. Total area of the Salin Township is about 894.14 sq mile of land. It was selected as the sample area because this township areas are known to keep typical and having higher population density of Shwe Ni.

#### 2.1.2 Pakokku Township

It is in Pakokku District of Magway Region; central dry zone of Myanmar above sea level 210 feet and coordinates 21°19'N, 94°56'E. The township has its eastern and southeastern border along the Irrawaddy (Figure 3). It is a dry land with the mean annual temperature ranging between 30°C and 45°C whereas the mean annual rain fall may reach to 10 inches. Total area of the Pakokku Township is about 485.839 sq mile of land. Pakokku Township was selected as the sample





Fig. 3. Magway Region (MIMU,2017).

area because there are abundant numbers of typical Pyar Zein breeds in this township.

#### 2.2 Experimental method and sample populations

The phenotypic characterization of Shwe Ni and Pyar Zein cattle in this study was based on the Food and Agriculture Organization's (FAO) guidelines for phenotypic characterization (FAO, 2012). Based on primary and exploratory approaches, the study was conducted for linear measurements and collection of data during field visits to the selected area. The study was carried out from 2016 April to 2016 May.

A total of 124 each of adult (over 2 years old) Shwe Ni and Pyar Zein cattle of both sexes (67 male and 57 female) were included in this study. The sample size was calculated as described in (FAO, 2012), with the confidence level set as 95%, (z=1.96), the margin of error as 10% (m=0.1), and estimated value for response www.mjvas.com

n= 
$$\left[\frac{z}{m}\right]^2$$
 p(1-p)

#### 2.3 Phenotypic characterization

The qualitative characters such as hair coat color, muzzle color, eyelid color and hoof color were noted. Moreover, the ear shape, ear orientation, facial appearance and backline profile were observed.

The quantitative phenotypic variants recorded from each cattle were: body length, heart girth, height at withers, ear length, face length, muzzle circumference, neck length, horn length, dewlap width, naval flap width, pelvic width, perpetual sheath, tail length and teat length. The descriptions for linear morphological measurements (FAO, 2012) are shown in table 1. Rondo graduated measuring-tape and laser distance measurer (BOSCH, GLM 50 Professional) were used to measure



#### Table 1. The descriptions for linear morphological measurements (FAO, 2012)

Traits	Specifications
Body length	The distance between point of shoulder and the pin bone
Heart girth	Circumference of the body behind the base of the hump and just behind the
	front legs
Height at withers	The vertical distance between ground and the point of wither
Horn length	Base to tip following its external curvature
Ear length	The base of the ear to the pointed end of the ear
Face length	The poll of the animal to the end of muzzle
Neck length	Proximal end of cervical region to the distal end of the cranial region
Dewlap width	The widest part of the base of the neck vertically
Naval flap width	Widest part from the base of the abdomen vertically
Pelvic width	Width between the two pins
Perpetual sheath	Widest part vertically from the base of the abdomen
Tail length	From the base of the tail to the pointed end of the tail
Teat length	From the base of the udder to the point of the teat



Fig. 4. Rondo graduated measuring tape

those quantitative phenotypic variants data (Figure 4 & view were based on the guidelines for phenotypic char-Figure 5).

The information for production system and management practice such as herd composition, type of feed, feed availability, person involved in management, disease control and mating system was collected by interviewing the farmers. The questionnaires for inter-



Fig. 5. Laser distance measurer

acterization of animal genetic resources (FAO, 2012).

#### 2.4 Statistical analysis

Data on qualitative characteristics were tabulated and analyzed in terms of percentages. The quantitative data collected in this study were analyzed by student- t test using SPSS statistical software (SPSS for windows, 22).



#### 3. Results

# 3.1 Qualitative measurements of Shwe Ni and Pyar Zein cattle

Qualitative measurements of two indigenous cattle are shown in table 2. The body hair coat pattern of Shwe Ni was plain red colour (86.57%) followed by pied (7.46%) and spotted (5.97%) in male and plain red (91.13%) followed by pie (3.61%) and spotted (5.26%) in female. In Pyar Zein, the body hair coat pattern was plain greyish white colour (89.02 %), pied (5.49%) and spotted (5.49 %) in male and plain greyish white colour (59.37%), pied (34.38%) and spotted (6.25%) in female.

In Shwe Ni male, the muzzle colour was red and pigmented (38.81%) and not pigmented red (61.19%) and in female red pigmented (40.35 %) and not pigmented red (59.65 %). In Pyar Zein , pigmented black (62.64%) and not pigmented black (37.36 %) and pigmented black (62.50%) in male and not pigmented black (37.50 %) muzzle colour in female. The evelid colour of Shwe Ni male was red pigmented (19.40 %) and not pigmented red (80.60 %) and in Shwe Ni female was pigmented red (24.56 %) and not pigmented red (75.44 %). In Pyar Zein male, eyelid colour was black pigmented (54.95 %) and not pigmented black (45.05 %) and in female, black pigmented eyelid colour was 56.25 % and not pigmented black eyelid color was 43.75 %. Hoof colour trait for Shwe Ni, red pigmented and not pigmented red were (4.48 %) and (95.52%) in male and (1.75%) and (98.25%) in female. In Pyar Zein black pigmented and not pigmented black hoof colour were (7.69%) and (92.31%) in male and (6.25%) and (93.75%) in female.

The rounded and straight-edged ear shapes in Shwe Ni were (53.73%) and (46.27%) in male and (49.12%) and (50.88%) in female. In Pyar Zein, (21.98%) rounded and (78.02%) straight edged in male and (9.38%) rounded and (90.62%) in female were observed. The common type of ear orientations in Shwe Ni male was (94.03 %) lateral and (5.97 %) drooping. In Shwe Ni female, (89.47%) lateral and (10.53%) drooping were observed. The ear orientations in Pyar Zein were lateral and drooping and their proportions were 67.04% and 32.96% in male. In female, no drooping ear was observed and showed 100% the lateral orientation.

The facial head appearances of Shwe Ni male and female varied from (56.72 %) and (61.40 %) straight, (19.42%) and (26.10%) concave and (23.86%) and (12.50 %) convex respectively. The facial head appearances of Pyar Zein male and female were varied from (44.96%) and (53.13 %) straight, (19.78%) and (15.62 %) concave and (35.26 %) and (31.25 %) convex respectively. The back-line profile of Shwe Ni was straight (68.66%) followed by slopes up toward the rump (25.36%), followed by slopes down from withers (2.99%) and dipped (2.99%) in male. The straight (56.10%) followed by slopes up toward the rump (29.82%), slopes down from withers (2.00%) and dipped (12.08%) in female. In male and female Pyar Zein cattle, the back- line profile of straight, slopes up toward the rump, slopes down from withers and dipped were (45.05%) and (37.5%), (41.76%) and (50.00%), (12.09%) and (12.50%), (1.10%) and (0.00%) respectively.

# 3.2 Quantitative measurements of Shwe Ni and Pyar Zein cattle

The phenotypic variants in body measurements of Shwe Ni and Pyar Zein cattle are shown in table 3 and table 4. Among male animals, phenotypic variants such as body length, heart girth, horn length and muzzle circumference are significantly longer in Pyar Zein than Shwe Ni. But Shwe Ni is significantly greater in ear length, face length and dewlap width than Pyar Zein (P < 0.05). There were no significant differences betwe-



		Percentage (%)				
Traits	- Descriptions	Shwe Ni		Pyar Zein		
	-	Male	Female	Male	Female	
	Plain	86.57	91.13	89.02	59.37	
Body hair coat	Patchy/pied	7.46	3.61	5.49	34.38	
pattern	Spotted/ Pigmented	5.97	5.26	5.49	6.25	
	Pigmented	38.81	40.35	62.64	62.50	
Muzzle colour	Red/Black not pigmented	61.19	59.65	37.36	37.50	
	Pigmented	19.40	24.56	54.95	56.25	
Eyelid colour	Red/Black not pigmented	80.60	75.44	45.05	43.75	
	Pigmented	4.48	1.75	7.69	6.25	
Hoof colour	Red/Black	95.52	98.25	92.31	93.75	
	not pigmented					
Farshana	Rounded	53.73	49.12	21.98	9.38	
Ear shape	Straight-edged	46.27	50.88	78.02	90.62	
	Erect	0.00	0.00	0.00	0.00	
Ear orientation	Lateral	94.03	89.47	67.04	100.0	
	Drooping	5.97	10.53	32.96	0.00	
	Straight	56.72	61.40	44.96	53.13	
Facial (head)	Concave	19.42	26.10	19.78	15.62	
	Convex	23.86	12.50	35.26	31.25	
	Straight	68.66	56.10	45.05	37.50	
Back line	Slopes up toward the rump	25.36	29.82	41.76	50.00	
prome	Slopes down from withers	2.99	2.00	12.09	12.50	
	Dipped	2.99	12.08	1.10	0.00	

-en Shwe Ni and Pyar Zein at high at withers, neck length, pelvic width, naval flap width, preputial sheath and tail length.

Among female animals, body length, heart girth, height at withers, ear length, face length, neck length, dewlap width, pelvic width, teat length and tail length were significantly longer (P < 0.05) in Shwe Ni than Pyar Zein. There was no significant difference between Shwe Ni and Pyar Zein at horn length and muzzle circumference.

The phenotypic variants in body measurements between male and female animals are shown in table 5

and table 6. Within Shwe Ni breed, body length, heart girth, high at withers, horn length and tail length were significantly longer (P < 0.05) in male than female animals. Ear length, face length, neck length, dewlap width and pelvic width were not significantly difference between male and female animals. Within Pyar Zein breed, body length, heart girth, high at withers, horn length, ear length, neck length, dewlap width, tail length and muzzle circumference were significantly longer (P < 0.05) in male than female animals. The face length and pelvic width were not significantly difference between male and female animals.



#### Table 3. Phenotypic variants in body measurements of male animals over 2 years of age

	Male (M		
Parameters	Shwe Ni	Pyar Zein	Sig. Level
Body length (cm)	112.47 ± 1.37 <sup>a</sup>	115.65 ± 1.01 <sup>b</sup>	(P < 0.05)
Heart girth(cm)	176.69 ± 2.57 <sup>a</sup>	$180.31 \pm 1.36^{b}$	(P < 0.05)
Height at withers(cm)	146.69 ± 1.29	147.37 ± 0.94	NS
Horn length(cm)	9.30 ± 0.76	17.71 ± 0.57	(P < 0.05)
Ear length(cm)	24.69 ± 0.37	23.65 ± 0.28	(P < 0.05)
Face length(cm)	53.73 ± 0.42	52.16 ± 0.42	(P < 0.05)
Neck length(cm)	30.00 ± 0.43	29.58 ± 0.60	NS
Dewlap width(cm)	22.77 ± 0.61	20.00 ± 0.44	(P < 0.05)
Pelvic width(cm)	43.94 ± 0.70	43.48 ± 0.54	NS
Naval flap width (cm)	2.42 ± 0.27	1.57 ± 0.17	NS
Perpetual sheath(cm)	3.92 ± 0.36	3.56 ± 0.22	NS
Tail length(cm)	108.83 ± 1.39	108.61 ± 1.25	NS
Muzzle circumference(cm)	44.63 ± 0.53	$45.46 \pm 0.31$	(P < 0.05)

NS = Not significant, means within the same row with different superscripts are significantly different at P < 0.05, SEM= Standard error mean

Table 4. Phenotypic variants in body measurements of female animals over 2 years of age

Deverse at ave	Female (M	Cir. Laurel	
Parameters	Shwe Ni	Pyar Zein	Sig. Level
Body length (cm)	103.15 ± 1.09 <sup>a</sup>	$96.48 \pm 0.79^{b}$	(P < 0.05)
Heart girth(cm)	144.48 ± 1.99 <sup>a</sup>	131.48 ± 1.20 <sup>b</sup>	(P < 0.05)
Height at withers(cm)	125.87 ± 1.29	118.80 ± 1.16	(P < 0.05)
Horn length(cm)	9.14 ± 0.67	9.90 ± 0.98	NS
Ear length(cm)	24.21 ± 0.34	19.39 ± 0.42	(P < 0.05)
Face length(cm)	48.08 ± 2.27	42.32 ± 0.75	(P < 0.05)
Neck length(cm)	28.52 ± 0.34	23.32 ± 0.43	(P < 0.05)
Dewlap width(cm)	18.33 ± 0.68	11.03 ± 0.53	(P < 0.05)
Pelvic width(cm)	37.48 ± 0.50	33.58 ± 0.66	(P < 0.05)
Teat length(cm)	3.34 ± 0.18	3.03 ± 0.17	(P < 0.05)
Tail length(cm)	99.73 ± 1.85	88.58 ± 0.68	(P < 0.05)
Muzzle circumference(cm)	37.81 ± 0.59	37.06 ± 0.44	NS

NS = Not significant, means within the same row with different superscripts are significantly different at P < 0.05, SEM= Standard error mean



Parameters	Shwe Ni (Me	Sig. Level	
	Male	Female	
Body length (cm)	112.47 ± 1.37	103.15 ± 1.09	(P < 0.05)
Heart girth(cm)	176.69 ± 2.57	144.48 ± 1.99	(P < 0.05)
Height at withers(cm)	146.69 ± 1.29	125.87 ± 1.29	(P < 0.05)
Horn length(cm)	9.30 ± 0.76	9.14 ± 0.67	(P < 0.05)
Ear length(cm)	24.69 ± 0.37	24.21 ± 0.34	NS
Face length(cm)	53.73 ± 0.42	48.08 ± 2.27	NS
Neck length(cm)	30.00 ± 0.43	28.52 ± 0.34	NS
Dewlap length(cm)	22.77 ± 0.61	$18.33 \pm 0.68$	NS
Pelvic width(cm)	43.94 ± 0.70	37.48 ± 0.50	NS
Tail length(cm)	108.83 ± 1.39	99.73 ± 1.85	(P<0.05)
Muzzle circumference(cm)	44.63 ± 0.53	37.81 ± 0.59	NS

## Table 5. Phenotypic variants in body measurements of Shwe Ni breed over 2 years of age

NS = Not significant, means within the same row with different superscripts are significantly different at P < 0.05, SEM= Standard error mean

Table 6. Phenotypic variants of body measurements in Pyar Zein breed over 2 years of age

Parameters	Pyar Zein (N	Sig. Level	
	Male	Female	
Body length (cm)	115.65 ± 1.01	96.48 ± 0.79	(P < 0.05)
Heart girth(cm)	180.31 ± 1.36	131.48 ± 1.20	(P < 0.05)
Height at withers(cm)	147.37 ± 0.94	118.80 ± 1.16	(P < 0.05)
Horn length(cm)	$17.71 \pm 0.57$	9.90 ± 0.98	(P < 0.05)
Ear length(cm)	23.65 ± 0.28	19.39 ± 0.42	(P < 0.05)
Face length(cm)	$52.16 \pm 0.42$	42.32 ± 0.75	NS
Neck length(cm)	$29.58 \pm 0.60$	23.32 ± 0.43	(P < 0.05)
Dewlap width(cm)	$20.00 \pm 0.44$	11.03 ± 0.53	(P < 0.05)
Pelvic width(cm)	$43.48 \pm 0.54$	33.58 ± 0.66	NS
Tail length(cm)	108.61 ± 1.25	88.58 ± 0.68	(P < 0.05)
Muzzle circumference(cm)	45.46 ± 0.31	37.06 ± 0.44	(P < 0.05)

NS = Not significant, means within the same row with different superscripts are significantly different at P < 0.05, SEM= Standard error mean

Based on the responses to questionnaires, the present study revealed that both Shwe Ni and Pyar Zein were kept for primary economic important. They are kept as source of in income and work on field. The main production system in both study areas was grass land with rotational grazing. The main feed resources available for cattle are community grazing land, crop residues after harvesting and agricultural-by products. The level of confinement was almost the same in both cattle breeds revealing that they are confine at night. In addition, the person involved in the management was close family members in both Shwe Ni and Pyar Zein.

#### 4. Discussion

In present study, the dominant coat colour in sample populations of Shwe Ni was red and Pyar Zein was greyish white coat colour. The coat color is used as one of the means of cattle identification in the study area. In a similar manner, coat colour is used as an identification of cattle in most pastoral communities (FAO, 2009). Shwe Ni was red coat colour, red eyelid, red horn, red muzzle colour and red hoof. The one with red coat colour, with black eyelid, black muzzle colour and horn was observed, and it was named Pyar Ni locally. Pyar Zein had back quarter and greyish patch around shoulder, with white coat colour, black eyelid, black muzzle, and black hoofs. The observed qualitative differences between the two breeds were predominantly non-pigmented red eyelid and red muzzle colour in Shwe Ni and pigmented black eyelid and black muzzle were predominantly in Pyar Zein. In male animals, Shwe Ni was predominantly round ear shape and Pyar Zein was predominantly straight-edge ear shape. The back-line profile was straight predominantly in Shwe Ni and predominantly slope up toward the rump in Pyar Zein. These differences in qualitative traits between the two cattle breeds may be due to the differences in genetic make-up in these traits.

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According to the findings in this study, the most common characteristics in both indigenous cattle breeds were plain hair coat and straight facial head with laterally oriented ear. Some of these characteristics were agreed with the qualitative description for indigenous Horro cattle in Bako tribe and Gobu Sayo districts of Oromia region, Ethiopia reported by Dereje and Kefelegn (2016). Horro cattle showed straight and flat facial profile, laterally oriented ears, medium sized hump in cervico-thoracic hump position predominantly.

The male population in present study, body length, hearth girth, horn length, ear length, face length, dewlap width and muzzle circumference of Pyar Zein were longer than Shwe Ni. In contrast to male population, body length, hearth girth, height at withers, ear length, face length, neck length, dewlap width, pelvic width, teat length and tail length of female Shwe Ni were greater than female Pyar Zein. This might attribute to the management differences and availability of feeds between the two townships. Regarding responses to questionnaires, males Pyar Zein were fed ad libitum the whole day whereas male Shwe Ni was fed three times per day. In addition, female was fed limited feeding in Pakokku Township as the feed availability seemed to be poor in Pakokku region. Pakokku is drier and has less rain fall than Salin. Moreover, Salin get more rain fall and availability of feed is better than Pakokku Township.

Within Shwe Ni breed, body length, hearth girth, height at withers, horn length and tail length were longer in male than female animals. Also, in Pyar Zein breed, body length, height at wither, horn length, ear length, neck length, dewlap length and tail length of male animals were greater than female. This finding was agreed with the findings of Rege (1999), Fasil and Worknen (2014) and Dereje and Kefelegn (2016) revealed that the mean value of on-farm morphological traits measurement on local male and female cattle

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Myan. J. Vet. Anim. Sci., 2020; 1(1): e2020.006

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result that males are usually greater their female counter female groups. This can be due to hormonal effect which allow male to grow more than female. In addition, differences in quantitative variants between male and female Pyar Zein was due to differences in feed availability between male and female in Pakokku Township.

Regarding the study of Dereje and Kefelegn (2016), the heart girth, body length, height at wither, horn length and neck length and muzzle circumference of Horro cattle from Africa were 140.82±8.88, 105.85±7.39, 111.55±4.01, 20.18±6.92, 30.33 ± 2.53, 36.43±11.6 in males and 131.53±5.93, 99.42±8.13, 107.18±7.89, 23.63±6.74, 30.98±2.47, 35.24±1.22 in female. Therefore, the height at wither was higher and muzzle circumferences was greater in Shwe Ni and Pyar Zein than Horro cattle for both sexes. However, the neck length and horn length were longer in Horro cattle than Shwe Ni and Pyar Zein. In addition, the heart girth and body length of male Shwe Ni and Pyar Zein cattle were 176.69±2.57 and 180.31±1.36 and 112.47±1.37 and 115.65±1.01 was greater than male Horro cattle. The female Shwe Ni 144.48±1.99 was greater heart girth and body length 103.15±1.09 than female Horro cattle.

The heart girth, body length, height at wither, horn length, ear length and muzzle circumferences of Bali cattle were 178.7±10.9, 119.0±8, 126.7±5.6, 24.4±2.8, 25.3±3.2, 46.5±4.5 in male from Bali and 145.3±7.0, 111.2±4.5, 110.8±2.7, 12.6±2.6, 22.7±2.2, 40.4±3.4 in female from Sumatra (Lindell, 2013). It can be seen that the body length, horn length and muzzle circumferences were greater in Bali cattle than Shwe Ni and Pyar Zein for both sexes. In addition, the male Bali cattle were longer ear length than Shwe Ni and Pyar Zein. On the other hand, the female Bali cattle were greater heart girth than Shwe Ni and Pyar Zein. However, the male Pyar Zein cattle were greater heart girth www.mjvas.com 180.31±1.36 and higher height at wither than male Bali cattle. Shwe Ni female were longer ear length and higher in height at wither than female Bali cattle. This diversity in quantitative traits among Shwe Ni, Pyar Zein and other indigenous cattle from various regions may be linked to their diverse genetic composition, nutritional status and environmental condition.

The production system, feed resources, level of confinement, person involved in the management and the use of animals in study areas were almost the same to the indigenous from other regions. Dereje (2016) revealed that, the purpose of keeping indigenous cattle, (Horro cattle) was for traction, milk production, income generation, and manure, threshing of crop, social status and for meat. The report of Ayantu et al. (2012) indicated that the main feed resource for livestock in the Horro district during the cropping season was natural pasture, whereas crop residues are the major feed in the dry season in the district as crop production is high in the farming community. The production involving Bali cattle in Indonesia can be divided into two groups, those under pasture management, also described as extensive, and those under a cut and carry system, also described as intensive or semi-intensive (Martojo, 2012). In Guduru area (Western Oromia) majority (60%) of farmers enclosed their cattle in fence at their back yard during nighttime (Demissu et al., 2014).

#### 5. Conclusions

Based on the result of this study, it could be concluded that Shwe Ni and Pyar Zein possess their own unique qualitative characteristics. It was observed that the quantitative measurements of male Pyar Zein was greater than male Shwe Ni and it was in reverse in female animals, that is, the quantitative measurements of female Shwe Ni was greater than female Pyar Zein. Within each breed, male animals showed greater quantitative measurements than female animals. The qualitative and quantitative characterization data collected

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in this study serve as a starting point for studying animal genetic resources from Myanmar and their conservation. Further investigation on phenotypic characters and confirmatory approach is recommended for fully exploiting the potential of breeds, such as age at puberty, age at first calving, calving interval, and lactation length.

#### Acknowledgments

We would like to express our gratitude to Agenzia Italiana per la Coopreazione allo Sviluppo AICS-Italian Cooperation in Myanmar projects for financial supports and LBVD of Salin and Pakokku township for their kindly assistance in data collection.

#### **Conflict of interest**

The authors declare that they have no competing interests.

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