

Development of blended yarns and fabric using chokla wool and camel hair

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Received: 06.04.2018; Revised: 13.10.2018; Accepted: 26.10.2018

■ **ABSTRACT :** The present study was conducted to investigate the effect of blending camel hair and chokla wool in different ratios and study the properties of fibres, yarn and fabric along with the acceptability of blended fabrics. Camel hair and chokla wool fibres were blended together in the proportion of 25:75, 50:50 and 75:25, respectively. Yarn of 100 per cent wool and camel fibre were also made for base reference. Different properties of blended yarn and fabric were evaluated. The study indicated that fabric sample of camel hair and chokla wool of 50:50 was a good blended fabric which showed good warmth, texture, luster and aesthetic appearance. So, it was concluded that camel hair can be successfully blended with chokla wool. Blending improves certain properties of chokla wool and camel hair.

■ **KEY WORDS:** Blending, Yarn count, Fineness, Tenacity

■ **HOW TO CITE THIS PAPER :** Paliwal, Jaya, Agrawal, Mamta and Bharti (2018). Development of blended yarns and fabric using chokla wool and camel hair. *Asian J. Home Sci.*, **13** (2) : 516-519, DOI: 10.15740/HAS/AJHS/13.2/516-519. Copyright@ 2018: Hind Agri-Horticultural Society.

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Blending of fibrous material is a technique to achieve and satisfy requirement of both, the manufacturer and consumer. The Blending is done to improve average mixing qualities, desired yarn properties for specific end use, reduce the cost and lead to both quantitative as well as qualitative changes (Kane *et al.*, 2001)

Wool is a unique animal protein fibre. Chokla wool is one of the important wool fibre which is used and processed in Bikaner mainly in carpet and rug making. Camel hair fibres belong to specialty hair fibres. These are the rare animal fibres which have unique characteristics such as lustre, softness, warmth and natural colour. These fibre modify and improve handle and appearance of final product either alone or in blended

form (Sharma and Pant, 2013).

Wool and camel hair both being animal (protein) fibres have almost similar chemical properties. Wool is finer and stronger and has better resilience as compared to camel hair.

An Endeavour has been made in this study to find out the effect of blending camel hair and chokla wool in different ratios and study the properties of yarn and woven fabric. Hence, the present study was taken up with the following objectives.

- To blend chokla wool and camel hair in different proportions.
- To access the physical properties of fibres and blended yarns.
- To access the physical properties and

acceptability of blended fabrics.

■ RESEARCH METHODS

The material, methods and techniques followed in the study are-

Selection of sample:

Chokla wool and camel hair were selected for study. Chokla wool of adult female was collected from Central Sheep and Wool Research Institute (CSWRI), Bikaner (Rajasthan) at the cost of Rs. 100 per kg.

Camel hair was collected from Bikaneri breed of male camel young (8 years of age) at the cost of Rs. 60 per kg.

Determination of fibre properties:

Fibre properties such as fibre fineness (m), average fibre length (mm), fibre medullation (%), crimp of yarn and tensile properties of fibre were tested using standard tests.

Development of chokla wool and camel hair blended yarn :

Camel hair and chokla wool fibre were blended together in the proportion of 25:75, 50:50 and 75:25, respectively. Yarn of 100% wool and camel fibre were also prepared for base reference.

After processing of fibres, the cleaned wool and their samples were spun using single drive spinning wheel (Z-twist) at Khadi Gramodhyog in Bikaner (Rajasthan). Camel hair and chokla wool fibre were blended at fibre stage with 25:75, 50:50 and 75:25 ratios and spun into a single yarn with Z-twist.

Determination of yarn properties :

The following properties of blended and pure yarns were tested-

Yarn twist- Yarn twist was determined with the help of automatic twist tester. Standard adopted for testing was IS: 832:1985

Yarn Count (IS: 3689-1966) - The measurement of fineness of yarn is yarn count and measured through wrap- reel.

Elongation with Single yarn breaking strength- was determined on the Instron Tensile Tester using IS: 1670: 1991 test method.

Development of fabric with chokla wool and camel hair blended yarn :

Fabric samples were prepared on simple hand loom using plain weave with blended yarns of 75/25, 50/50, 25/75 of chokla wool and camel hair. The base sample was woven using chokla wool where as the camel hair yarn could not be woven due to lack in strength and unevenness of yarn.

Determination of fabric properties :

Fabric count- number of ends and picks per square inch of fabric using magnifying glass.

Weight per unit area was determined with the help of digital balance.

Thickness - Prolific thickness tester was used to determine using IS:7702-1975 test method.

Bursting strength of fabric - was determined on bursting tester using ASTM D3786-87 test method.

Abrasion / wear and tear testing-was determine by 'stoll universal wear tester" using ASTM 1175-64 T method.

Thermal insulation value (tog)- measurement of 'warmth' of fabric is thermal insulation value. Thermal insulation was measured in terms of tog' using ASTM D 1518-1985 standard.

Acceptability of blended fabric :

A panel of 10 experts (who have knowledge about tactile properties of textile fibres) carried out the visual assessment of blended fabric. Five point scale was made for subjective evaluation.

Statistical analysis :

Data collected regarding physical properties of blended fabrics were analysed using t-test for comparing sample means.

■ RESEARCH FINDINGS AND DISCUSSION

It was observed that Chokla wool fibre showed greater staple length and fibre fineness as compared to camel hair whereas camel hair showed higher tenacity and elongation percentage.

Yarn properties of chokla wool and camel hair blends :

The results of yarn properties indicated in Table 1 showed that pure chokla wool yarn was finer and more

Table 1 : Properties of chokla wool and camel hair blended yarns

Sample Code	Yarn CH/C	Yarn count (Nm)	Twist/ inch	Tenacity g/tex	Elongation %
A	0:100	6.97	6.89	1.75	5.06
B	25:75	6.82	6.67	1.38	4.45
C	50:50	6.69	6.74	1.52	5.28
D	75:25	6.57	6.45	1.49	4.52
E	100:0	5.28	6.29	1.13	4.36

C= Chokla CH= Camel hair A= 100% Chokla wool
 B= 25 CH/ 75 C C= 50 CH/ 50 C D= 75 CH/ 25 C E= 100% Camel hair

Table 2 : Analysis of fabric properties

Fabric Code	Blend composition CH:C	Bursting strength (kPa)	Fabric count		Abrasion loss (% weight loss after 1000 cycles)	Fabric thickness (mm)	Fabric weight (GSM)	Thermal insulation value, tog
			EPI	PPI				
A	0:100	610.4	8	7	9.15	2.02	340.61	1.15
B	25:75	625.2	7	6	12.34	2.35	450.33	1.26
C	50:50	655.8	7	6	16.53	3.50	485.75	1.32
D	75:25	695.7	6	5	18.32	3.75	490.62	1.38
t-		39.6*	19.8*	17.5*	5.5*	7.9*	14.6*	34.6*

* indicates significance of value at P=0.05 level of significance

A= 100% Chokla wool B= 25 CH/ 75 C C= 50 CH/ 50 C
 D= 75 CH/ 25 C E= 100% Camel hair C= Chokla

CH= Camel hair

uniform than pure camel hair yarn. Fineness of camel hair yarn improved on blending with chokla wool and camel hair.

The results revealed that chokla wool was stronger than camel hair hence on increasing chokla wool in camel hair yarn tenacity increased. The results showed that yarn elongation was maximum in chokla wool and camel hair 50:50 blend.

Development of blended fabric :

The results showed (Table 2) that cloth thickness and bursting strength was greater in chokla wool fabric less abrasion loss in comparison of their blends, whereas thermal insulation value was greater in chokla wool and camel hair blend 25/75.

Subjective evaluation of blended fabrics :

It was observed that consumer acceptability of pure chokla wool and their blends were more pertaining to texture, lustre, woolen feel and aesthetic appearance. Sample A 100 per cent chokla wool was found to have good texture, lustre and aesthetic appearance but weak in warmth of the fabric.

Fabric sample of 50:50 ratio was found to have excellent warmth. Therefore all data indicated that the fabric sample of camel hair and chokla wool of 50:50

was a good blended fabric which showed good warmth, texture, lustre and aesthetic appearance.

Conclusion :

It was concluded from the study that camel hair can be successfully blended with chokla wool. Blending improves certain properties of wool and camel hair. Wool fibre also improves the spinnability, fineness and tenacity of camel hair. On the other hand camel hair improve bursting strength and thermal insulation. Thus, the blends of camel hair and chokla wool can be used and recommended for commercial purposes.

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