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**DEVELOPMENT OF KNITTED MATERIALS  
FOR THE MANUFACTURE OF ADAPTIVE CHILDREN'S CLOTHING**

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During the implementation of basic skills, in particular, the process of dressing, children with developmental disabilities quite often face serious difficulties, which subsequently affect their participation in social and recreational activities. This, in turn, affects their quality of life and burdens caregivers, leading to stress and exhaustion. Highlighting the issue of developing functional clothing for children with disabilities can stimulate designers to introduce innovations in the clothing field for a broader range of people with special needs [1-3].

In creating such clothes, it is important to use textile materials and accessories with appropriate surface properties since the quality of the surface of clothes is essential for children with various disorders of psychophysical development [4]. Thanks to the successful selection of textile materials in terms of raw material composition, weave structure, and final finishing, the clothes provide optimal conditions for maintaining thermal balance, constant temperature, and tactile comfort, which is determined by the sensitivity of the skin when the clothing materials touch the child's body (smoothness, stiffness, roughness, etc.) [5].

UNICEF estimates that one in ten children in the world lives with a disability, with more severe cases occurring more often among children under the age of seventeen. Approximately 240 million children face functional and psychosocial difficulties [6], and about 1.3 billion people have a significant disability, according to WHO data [7]. Disability is characterized by a physical or mental condition that causes limitations in mobility, muscle weakness, and stiffness [8]. Children with such disabilities face challenges in leisure time, self-care, and daily activities [9, 10]. The inability to dress independently affects their participation in social and recreational activities, negatively affecting their quality of life [11, 12]. Therefore, there is a great need to solve clothing-related problems by introducing innovative solutions in clothing design, which will contribute to increasing children's independence, facilitating caregivers' work, and improving the quality of life.

The relevant sanitary and hygienic norms and standards determine children's knitwear's ergonomic (anthropometric, hygienic and physical-hygienic) and operational characteristics. Ergonomic requirements are based on anthropometric and physiological characteristics of children, including the sensitivity of their skin to physical and chemical irritants. They also take into account the immature immune system, which does not provide full protection against harmful effects. That is why the hygienic and physical-hygienic properties of knitwear significantly affect the well-being of the child and the normal functioning of the body in general [13]. The regulatory document [14] specifies the requirements for the hygiene of children's

knitwear.

The study of the influence of the type of weaving and the raw material composition of the yarn on the consumption characteristics of the developed samples of knitted materials, namely: hygroscopicity, vapor permeability, capillarity, air permeability, and relaxation of deformation, allows a decision on the choice of one or another type of weaving and type of yarn for the manufacture of adaptive children's knitted products.

The most common basic single and double-knit structures were selected to produce experimental samples of knitted materials: plain, rib, and combined rep. The following types of yarn were used as raw materials: linen with a linear density of 25×3 tex, bamboo - 32×2 tex, and nettle - 32×2 tex. The experimental samples of knitted materials were produced on a double-bed flat knitting machine, PVRK type, class 10.

The results of studies on the hygienic properties of the developed samples of knitted materials allowed for the determination of preference for single plain knit and double combined knit (rep type) for the spring-summer season of adaptive children's knitwear. Nettle and linen yarns are suitable raw materials for this purpose. Based on consumer characteristics, these natural types of raw materials are appropriate for the spring-summer assortment. However, considering the target group and conditions of use, which involve direct contact with a child's skin, bamboo yarn proves to be the most favorable in terms of hygienic properties and tactile sensation for the production of adaptive children's knitwear, even though it slightly underperforms in hygiene properties compared to nettle and linen yarns. Given the requirements for textile materials intended for children's wear, bamboo yarn is well-suited for producing all-season children's clothing due to its antiseptic, antibacterial, hypoallergenic, and durable properties.

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