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# THE IMPACT OF AGE AND PHYSIOLOGICAL STAGE ON SOME BIOCHEMICAL PARAMETERS AND IMMUNE GLOBULIN IN LOCAL AND CROSSBREED HOLSTEIN DAIRY COWS

**Fallah Abd-Almohssien Abdalla AL-Asadi[1*] , Waleed Y. K.[2], Khalaf A. H. Al-Rishdy[3]**
*[1*]Reproductive Physiology, Animal Production, College of Agriculture, University of Basrah, Iraq.*
*[2]Animal Physiology, Animal Production, College of Agriculture, University of Basrah, Iraq.*
*[3]Reproductive Physiology, Animal Production, College of Agriculture, University of Basrah, Iraq*
*Email:* [2]waleed.yosief@uobasrah.edu.iq
*Corresponding Email:* falah.abd_allah@uobasrah.edu.iq

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**Abstract:**
This study was conducted in one of the animal fields in the Abi Al-Khassib area to investigate the impact of age and physiological stage on some biochemical parameters in the serum of local and crossbreed Holstein dairy cows. A total of 32 cows, including 16 local cows and 16 crossbreed Holstein cows, aged between 3 and 6 years were used during the period between 1st December 2019 to 31th May 2020, the total period of the experiment was 6 months, divided into two physiological stages: 3 months before parturition (gestation) and 3 months after parturition (lactation). The results showed a significant ($p<0.05$) increase in the concentrations of most biochemical parameters (cholesterol, glucose, triglycerides, urea, total protein, IgA, IgG, IgM, ALP) in older cows compared to younger cows, except for the ALT and AST enzyme concentrations. Pregnant cows had significantly($p<0.05$) higher levels of cholesterol, triglycerides and total protein compared to lactating cows, while lactating cows had significantly ($p<0.05$) higher levels of glucose, urea, enzymes (ALT, AST, ALP), and immunoglobulins (IgA, IgG, IgM). Additionally, the crossbred (H×L) cows had significantly ($p<0.05$) higher levels in cholesterol, glucose, triglycerides, urea total protein and ALP compared to the local breed cows. Whereas, the local breed cows recorded significantly ($p<0.05$) higher levels of ALT and AST enzymes and immunoglobulins (IgA, IgG, IgM) in the serum compared to the crossbred cows

**Keywords:** Age, Physiological stage, Biochemical parameters, Local breed, Holstein, Dairy cows.

## INTRODUCTION

Cows are the first in produce milk when compared with other ruminant animals, and this production primarily depends on the content and components of milk, especially fat and protein (Parwin et al., 2005). Milk production is a quantitative trait influenced by various factors, including both genetic and non-genetic factors, genetic factors are associated with the breed and the genes carried by the animal, while non-genetic factors include the sex of the offspring, age of the animal, physiological status, health condition and external influences such as season and nutrition (Moretti et al., 2017; Dillane et al., 2018; Consolo et al., 2018).

Pregnancy and lactation stages in farm animals are considered a physiological condition that leads to dramatic changes, pregnant and lactated cows, in particular, often experience stress that results in significant alterations in blood parameters and metabolic components, there are many various changes occur in the female during, some of these changes involve fluctuations in nutrient metabolism, especially since the priority is to ensure fetal growth, which can lead to a decline in the body's blood parameters (Mir et al., 2008 ; Piccione et al., 2012).

Most of the problems faced by high-production cows occur immediately after calving and at the beginning of their production, this is due to negative energy imbalance, leading to increased lipolysis in the body, accumulation of fat in the liver, development of fatty liver deposition and increased concentration of enzymes (ALT, AST) (Bobe et al., 2004; Mohamed, 2014). Many studies have confirmed that breed, age and physiological status of cows have a significant effect on several biochemical parameters in their blood, including glucose, cholesterol, triglycerides,