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Ontogenesis and pattern of expression of glucose transporters GLUT-1, -8 and -12 in different chicken muscles

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Chickens exhibit some peculiarities for glucose metabolism, i.e. a high glycaemia and a low sensitivity to exogenous insulin. Glucose transport into cells is the first limiting step for the regulation of glucose homeostasis. It is mediated by a family of glucose transporters (GLUT), either playing a constitutive role (GLUT-1) or being recruited to the plasma membrane in response to insulin (GLUT-4, GLUT-8 and GLUT-12). Up to date only GLUT-1, -8 and -12 have been described in chicken muscles but not fully characterized. The aim of the present study was to explore the ontogenesis and the expression of these three main GLUTs in avian muscles.

The pattern of GLUTs expression was determined in different muscles removed from chickens at 9 wks of age. Ontogenesis study was restricted to the *Pectoralis major* and the *Sartorius* muscles, collected at 12 and 19 days during embryogenesis, hatch and 5 days post-hatch. Each GLUT presented a specific pattern of expression depending on the type of muscle. GLUT-1 was mainly expressed in slow oxidative muscles, GLUT-8 in mixed-type oxido-glycolytic muscles and GLUT-12 in fast-twitch glycolytic muscles. The patterns of expression of GLUT were also time-dependent, GLUT-1 being more expressed during early embryogenesis whereas GLUT-12 was mainly expressed after hatch. This study provides a basis to understand the regulation of glucose homeostasis in chickens.