

EFFECT OF FOOD DEPRIVATION AND REFEEDING ON VASOTOCIN AND ISTOCIN RECEPTOR GENES EXPRESSION IN THE GILTHEAD SEA BREAM (*Sparus aurata*)

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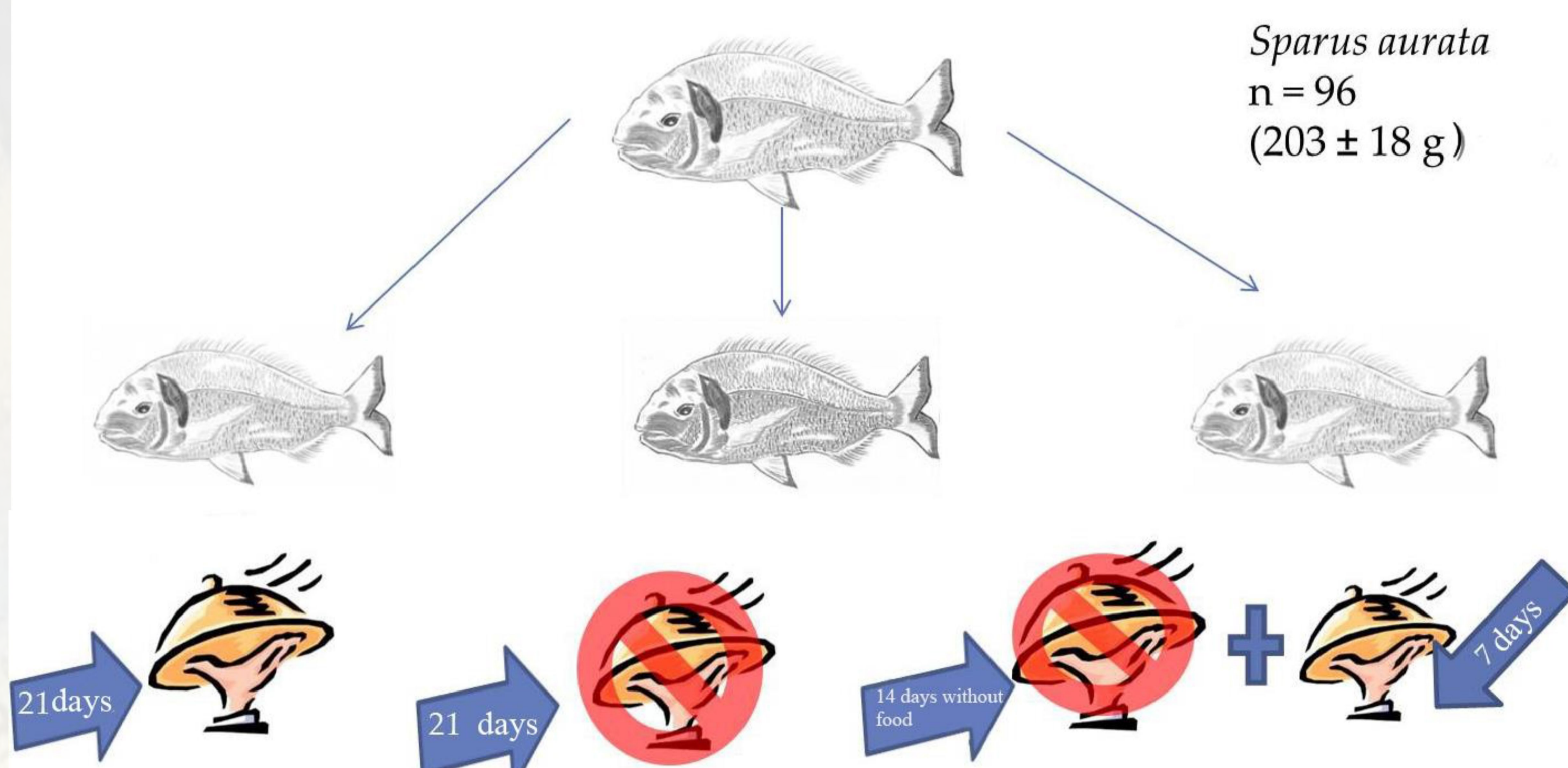
INTRODUCTION

AVT and IT are neurohormones synthesized in hypothalamic nuclei and released to the blood stream in the neurohypophysis. Changes in hypothalamic, pituitary AVT and IT concentrations were found in many fish species subjected to different type of stress, e.g. confinement, disturbance, high density, food deprivation or osmotic. Two distinct AVTR receptors subtypes named V1a2 and V2 have been identified in *Sparus aurata*. Also a single ITR has been reported (Martos-Sitcha et al., 2012).

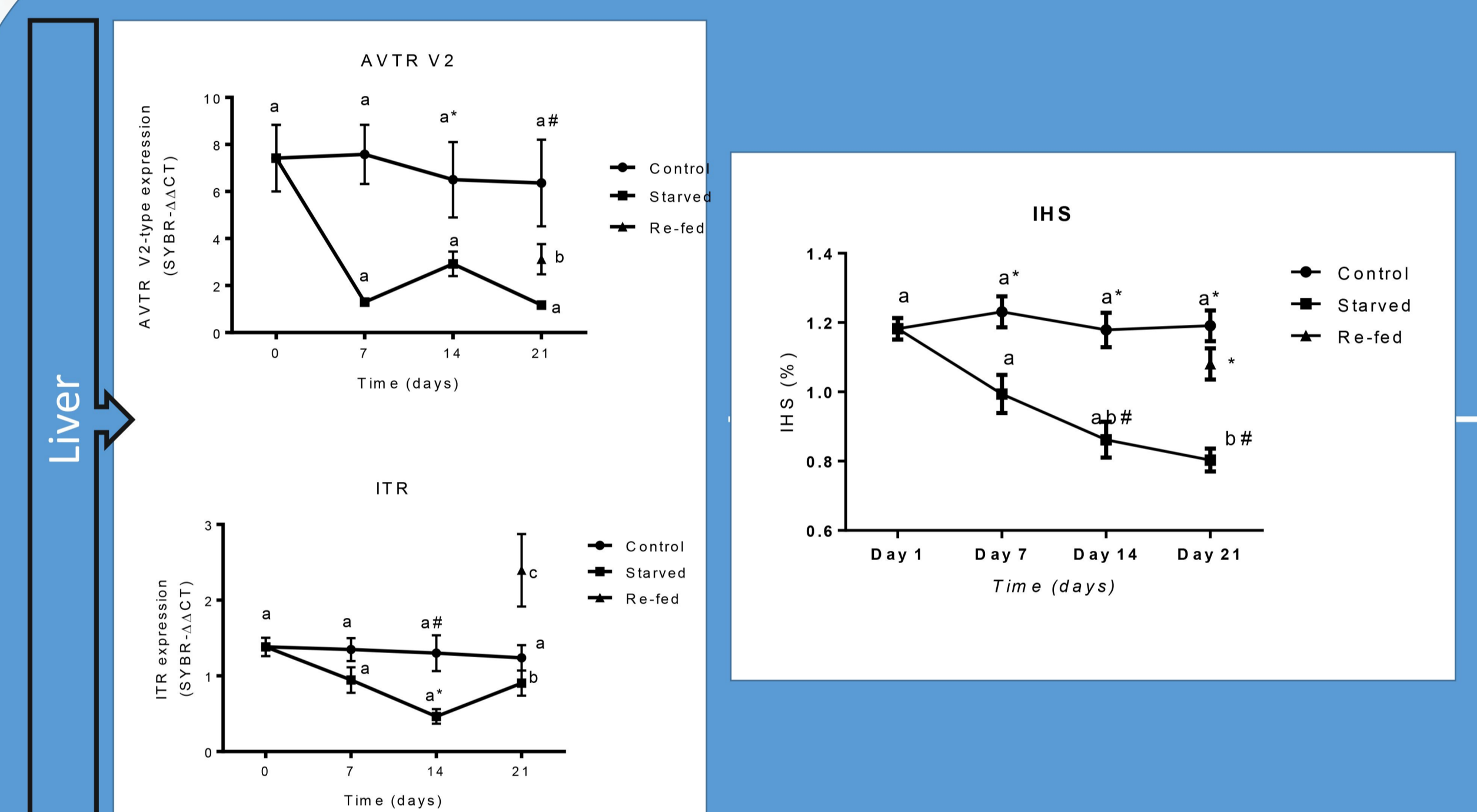
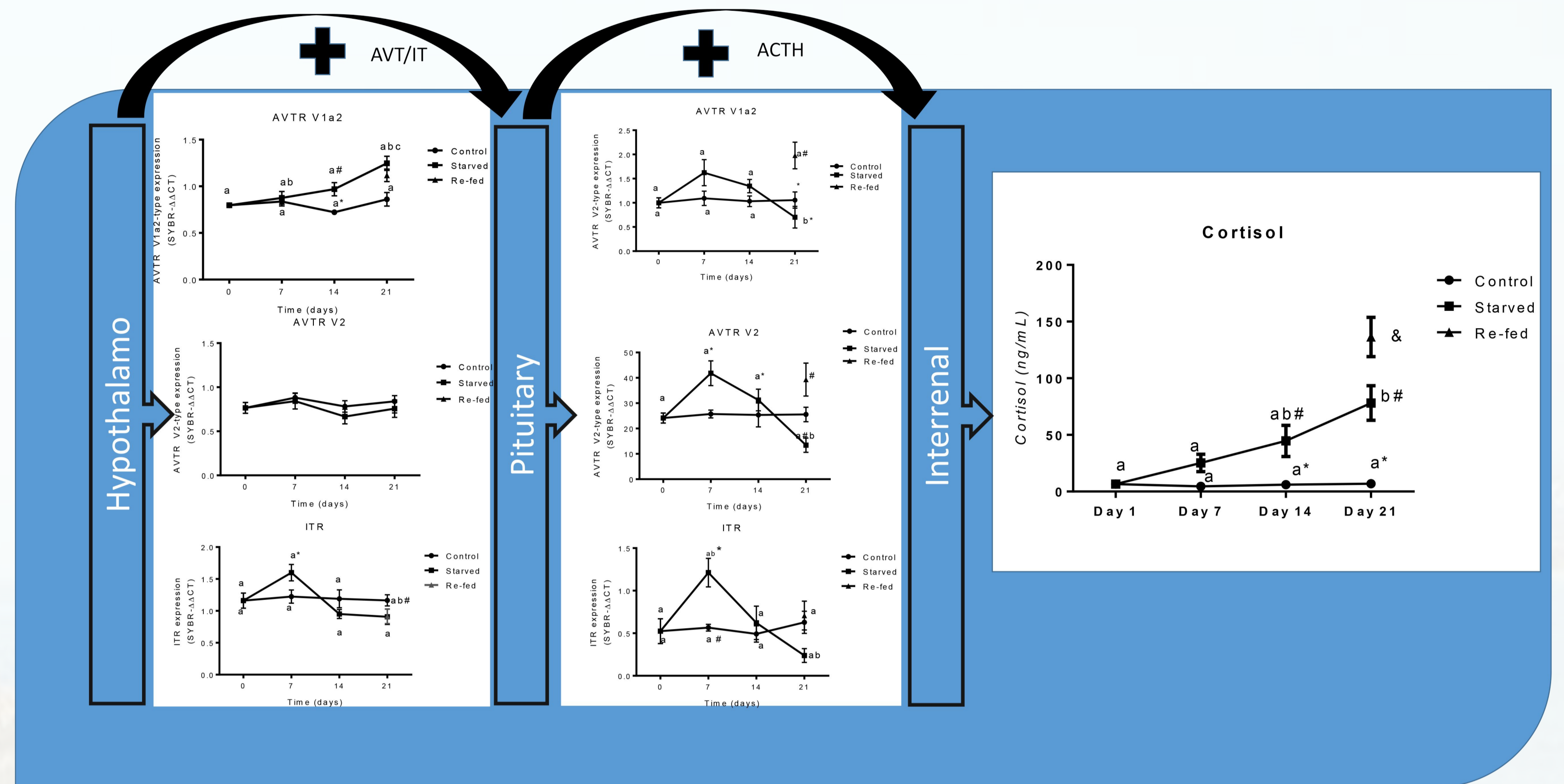
AVT and IT systems had not been study previously in the influence of lack of food or re-feeding situations as stress sources. This study was designed to examine these effects from two points of view: i) a metabolic perspective given the remobilization of energy reserves of the food deprived animals compared with those specimens re-fed, and ii.) stress system, because this situation induces a stimulation of the system in order to activate the metabolic processes of mobilization.

MATERIALS AND METHODS

EXPERIMENTAL DESIGN



RESULTS



Parameter	Treatment	Day 0	Day 7	Day 14	Day 21
Plasma Glucose (mM)	Control	4,84±0,095 a	4,83±0,204 a	4,97±0,172 a	4,75±0,164 a
	Starved		5,29±0,173 b	5,35±0,212 b	5,37±0,204 b*
	Re-fed				5,53±0,276*
Plasma lactate (mM)	Control	2,908±0,199 a	3,13±0,154 a	2,77±0,110 a	2,83 ±0,261 a
	Starved		2,98±0,183 a	2,82±0,224 b	3,63±0,47 b*
	Re-fed				2,58±0,2213 a
Liver TGA (μmol TAG/g pf)	Control	4,88 ±0,16 a	4,86±0,22 a	5,05±0,55 a*	4,89±0,22 a*
	Starved		3,88±0,86 a	3,29±0,08 a#	3,20±0,11 a#
	Re-fed				4,94±0,154*
Live glucose (mg glc/g pf)	Control	4,2 ±0,10 a	3,6±0,20 a	2±0,15 b	2,4±0,12 b
	Starved		2,9 ±1,78 a	3,5±0,10 a	2,8±0,13 a
	Re-fed				3,7±1,02*
Liver glycogen (mg glc/g pf)	Control	46,1±0,63 a	46,3±1,04 a	44,8±0,66 a*	49,1±1,11 a*
	Starved		34,5±1,42 a	18,2±0,68 b#	14,9±0,39 b#
	Re-fed				32,8±1,14*

DISCUSSION AND CONCLUSIONS

1. The situation of food deprivation induces metabolic alterations in plasma and decrease energy reserves in the liver. The refeeding induces a metabolic reorganization conducive to regain metabolic homeostasis.
2. The high values of plasma cortisol in both groups : food-deprived and re-fed group indicate a situation of stress and metabolic activation during the refeeding .
3. The results obtained for the various components of vasotocinergic and isotocinergic systems (AVT values and expression of the pro-vasotocin in hypothalamus and AVT receptor in liver) show an activation of both systems during situation without food as during the re-feeding, suggesting an involvement in both system AVT in physiological processes. The comparative analysis of the results of expression of hypothalamic pro-VT, indicate the existence of various periods in time, clearly differentiated by the response of arginine vasotocin system.
4. Concerning endocrine function cannot be excluded a direct action of AVT on the liver. The existence of hepatic receptors for AVT (V1a2 type) in *S. aurata* suggests the existence of a direct action of AVT in the liver. Also food deprivation increases level of expression of type V1a2 AVTR the liver, and this coincides with a decrease in glycogen levels (which may be due to high levels of cortisol) .
5. One week of re-feeding is not sufficient to complete metabolic reorganization and more time is needed for the expression V1a2 AVTR returns to normal levels, because the activation / deactivation of gene expression may involve a longer period of stabilization to the equilibrium state.

