

## LEARNING OBJECTIVE

Know and evaluate new alternatives for an optimized dietary management of histamine intolerance.

## STUDY OBJECTIVE

The aim of the present study was to evaluate the histamine degrading capacity of a DAO extract from pig kidney combined with vitamin C.

## BACKGROUND

Histamine is detoxified by intestinal diamine oxidase (DAO). A deficit of DAO activity can result in histamine intolerance, a clinical condition characterized by allergic-like symptoms. Histamine intolerance can be treated with exogenous DAO supplementation. The aim of the present study was to evaluate the histamine degrading capacity of a DAO extract from pig kidney combined with vitamin C.

## MATERIALS AND METHODS

Kinetic characterization of DAO extract (DAOgest, Bioiberica S.A.U., Spain) was determined using histamine as a substrate. Histamine concentrations ranging from 1.1 to 555 mg/L were incubated with DAO extract. Histamine reduction was determined by HPLC-PDA using an *in vitro* system (sodium phosphate buffer, 20 mM; pH 8.0) in which DAO extract was incubated at 37°C for 5 h with histamine at a concentration ranging from 10 to 150 mg/L. In a subsequent experiment vitamin C was added to the medium using 10 and 20 mg/L of histamine.

## RESULTS

### HISTAMINE DEGRADATION KINETICS

Enzyme activity of the DAO extract increased with increasing histamine concentrations until 0.63mM (69.5 mg/L) showing substrate inhibition (figure 1).

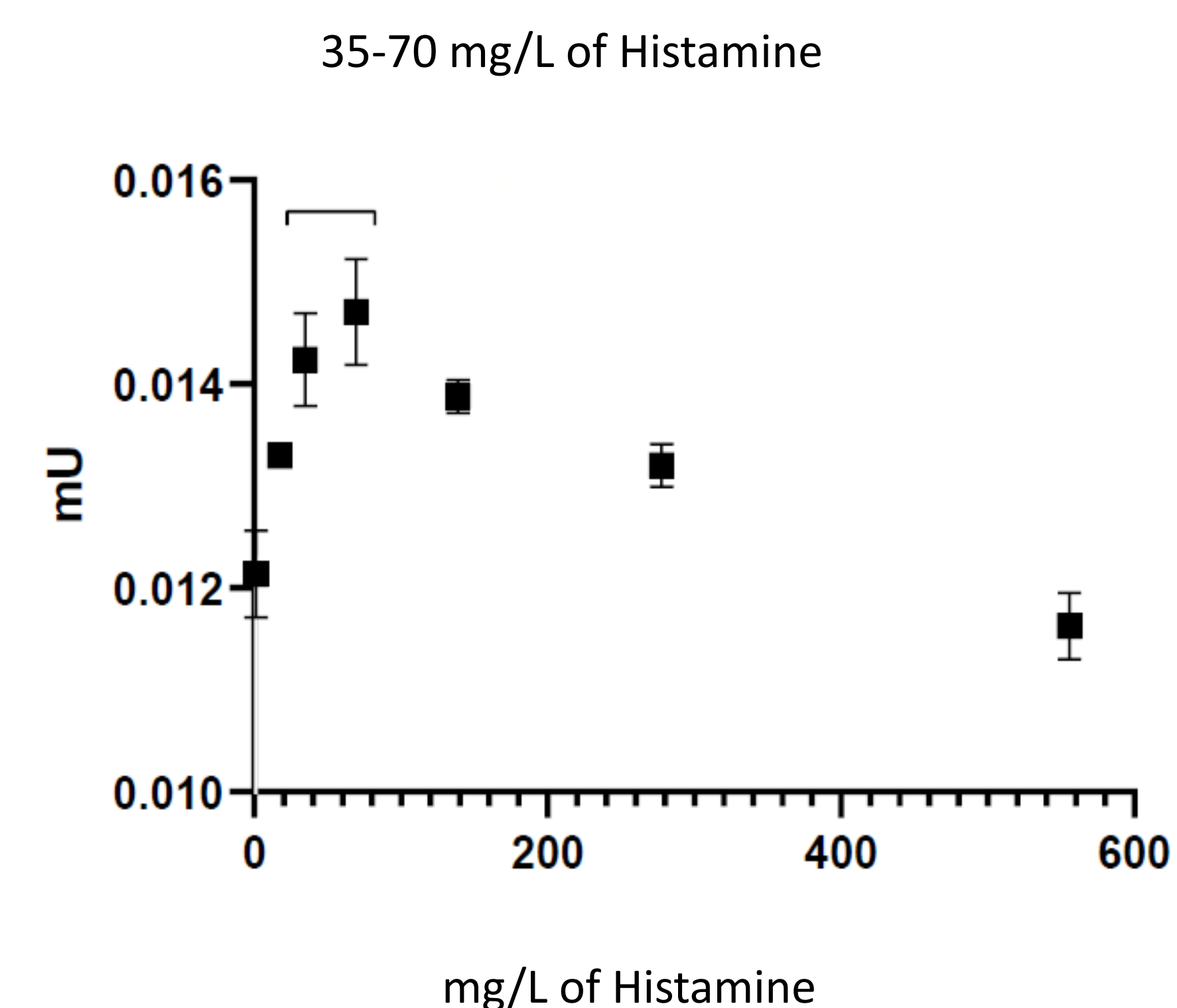


Figure 1. Kinetics of the DAO extract activity using histamine concentrations ranging from 1.1 to 555 mg/L.

### PERCENTAGE OF HISTAMINE DEGRADATION

Using 4.2 mg of DAO extract, higher histamine reductions were obtained with the lower histamine concentrations (16% at 20 mg/L; 30% at 10 mg/L). The addition of 10 mg of vitamin C to the media increased the reduction of histamine reaching 77% at 20 mg/L and 73% at 10 mg/L (figure 2).

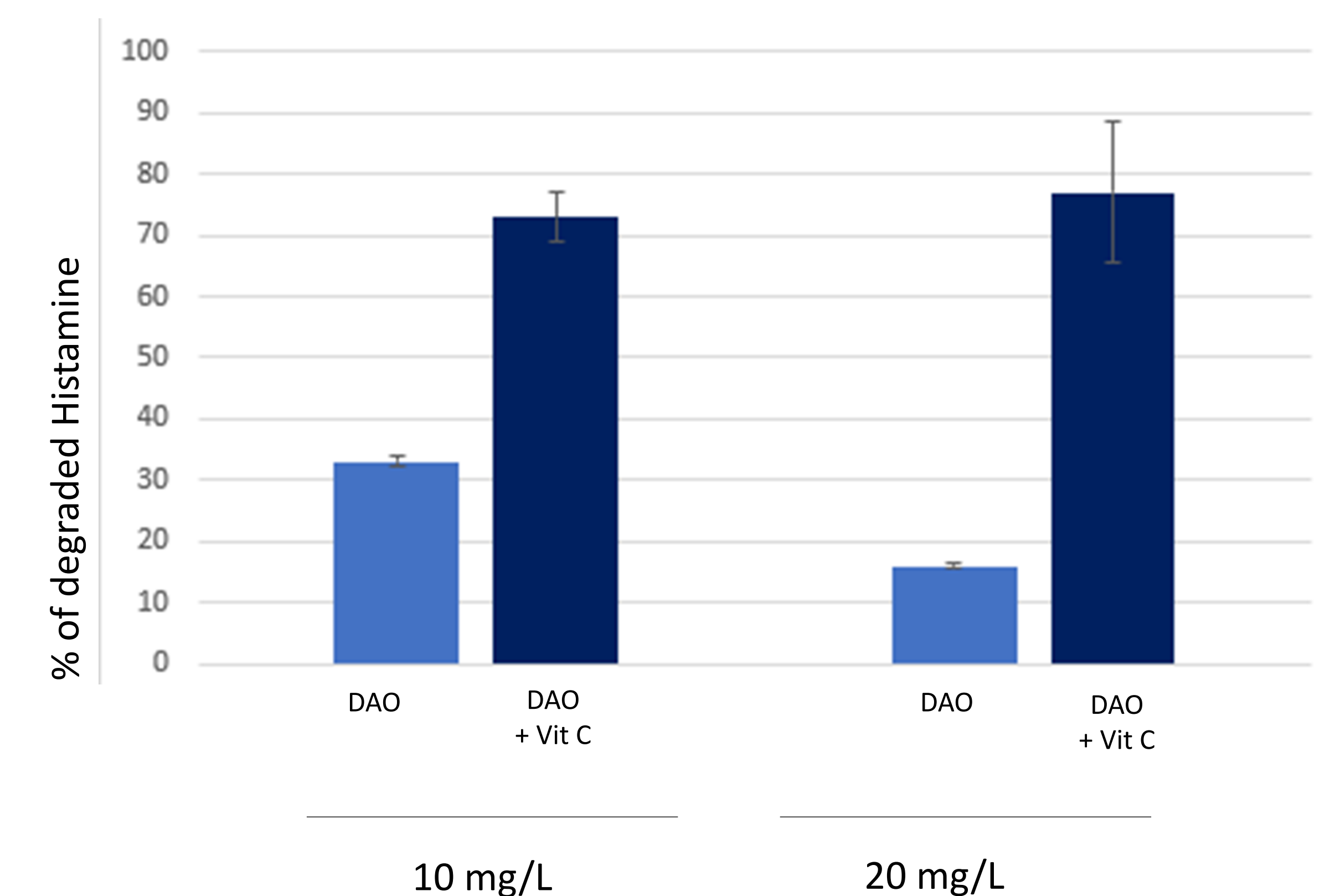


Figure 2. Histamine degradation after the incubation 5h of DAO extract with histamine at 10 and 20 mg/L

## CONCLUSIONS

The supplementation of DAO extract with vitamin C increases the enzymatic activity of DAO. These results suggest that dietary supplementation with DAO from pig kidney and vitamin C might help in reducing symptoms associated with histamine intolerance.