*Proceedings of the Nutrition Society* (2011), **70 (OCE6)**, E363 doi:10.1017/S0029665111004484

*Winter Meeting, 6–7 December 2011, 70th Anniversary: Body weight regulation – food, gut and brain signalling*

# Imidazole dipeptide content of dietary sources commonly consumed within the British diet

G. Jones[1,2], M. Smith[2] and R. Harris[2]

[1]*Department of Diet & Population Health, MRC Human Nutrition Research, Cambridge, England and* [2]*Department of Sports & Exercise Sciences, University of Chichester, Chichester, UK*

Interest in the imidazole dipeptides (ImD) has increased in response to data showing elevated levels following β-alanine supplementation have improved athletic performance[(1)] and have anti-senescent effects[(2)]. The diet can provide a variety of sources of ImD, predominately anserine and carnosine. Previous analyses of ImD sources have primarily measured the ImD content of meat from aquatic mammals and game foods[(3,4)], which are not commonly consumed within the British diet[(5)]. Therefore, calculation of ImD content provided by the British diet requires the measurement of reference values for the most commonly consumed foods within the diet.

This study analysed triplicates of 10 commonly consumed foods within the British diet selected from the NDNS[(5)] to develop reference values to calculate ImD intake. So as samples were representative of the same quality (age, storage procedures) as those consumed within the general diet, samples were obtained from both supermarkets and specialist retailers. Thus samples encapsulated those that can be purchased across the socio-economic spectrum. Samples ($n$ 3 × 10 mg) were obtained from core biopsies from three samples of each food ($n$ 9 for each food measured) and were freeze-dried before being extracted in methanol : borate and analysed via HPLC[(6)] for their anserine and carnosine content.

| | | Anserine mmol·kg$^{-1}$ dm | | Carnosine mmol·kg$^{-1}$ dm | | Total Imidazole Dipeptides mmol·kg$^{-1}$ dm | |
|---|---|---|---|---|---|---|---|
| Animal/species | Sample Site | mean | SD | mean | SD | mean | SD |
| Hondura Prawns | Whole | 321.8 | 26.3 | 40.9 | 5.2 | 362.8 | 14.1 |
| North Atlantic Prawns | Whole | 287.2 | 45.0 | 51.5 | 5.1 | 338.6 | 49.6 |
| Turkey | Pectoral | 176.3 | 38.4 | 46.7 | 10.9 | 223.0 | 48.1 |
| Chicken | Pectoral | 144.2 | 24.1 | 54.0 | 13.2 | 198.1 | 37.2 |
| Tuna | Mid fillet | 137.4 | 23.4 | 4.7 | 1.1 | 142.1 | 24.3 |
| Beef | Rump | 19.3 | 1.1 | 70.4 | 7.2 | 89.7 | 8.3 |
| Lamb | Rump | 47.1 | 2.0 | 33.6 | 1.5 | 80.8 | 3.4 |
| Pork | Rump | 1.1 | 0.4 | 55.4 | 3.3 | 56.5 | 2.9 |
| Mackerel | Mid fillet | 2.0 | 2.8 | 34.6 | 13.1 | 36.6 | 15.3 |
| Rainbow Trout | Mid fillet | 21.2 | 21.6 | 0.5 | 0.1 | 21.6 | 21.5 |

Values are means for triplicate samples from 3 muscle samples.

The results show that there can be a 17 fold difference ($P<0.01$) in ImD content of the different foods. This data extends knowledge of ImD in British foods and can be applied to dietary records to provide more robust information on ImD in the British diet. The data highlights foods that could potentially be manipulated to increase ImD consumption and with further additional analysis of foods can be used to control for habitual dietary intake in future studies investigating the effect of supplementation or diet on increasing muscle carnosine content.

This work was supported by a study grant from the Turkey Sector Group of the British Poultry Council (BPC).

1. Artioli GG, Gualano B, Smith A *et al*. (2010) *Med Sci Sports Exerc* **42**, 1162–1173.
2. Gallant S, Semyonova M & Yuneva M (2000) *Biochemistry (Mosc)* **65**, 866–868.
3. Suyama M, Suzuiki T, Maruyama M *et al.* (1970) *Bull Japan Soc Sci Fish* **36**, 1048–1053.
4. Davey CL (1960) *Arch Biochem Biophys* **89**, 303–308.
5. Department of Health (2010) http://www.food.gov.uk/multimedia/pdfs/publication/ndnsreport0809.pdf
6. Jones G (2011) PhD Thesis, University of Chichester.