Cependant la noradrénaline n'a pu être localisée par la méthode histochimique chez *Helix*[20], et le contenu en noradrénaline et en octopamine est pratiquement le même pour les différents ganglions[6]. Ces observations sont en faveur de la première possibilité.

Nos résultats montrent que les taux d'amines sont augmentés en présence d'un IMAO. Or la tyramine est un excellent substrat pour la MAO d'*Helix*[21]. Par contre, l'octopamine est un mauvais substrat. L'identification des acides correspondant à ces 2 amines a été réalisée, mais sera exposée ultérieurement. Il apparaît donc que, malgré sa faible représentation dans le système nerveux et le cœur, la MAO peut intervenir soit en régulant la synthèse des amines, soit en les inactivant au cours des phénomènes de libération.

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The density and chemical composition of fish muscle[1]

K. Dabrowski[2]

Limnology Laboratory, New University of Ulster, Traad Point, Drumenagh, Magherafelt, Co. Derry (N. Ireland), 30 January 1978

Summary. The relationship between the density of muscle from *Coregonus pollan* Thompson and its chemical composition has a parabolic nature which makes prediction of fat or dry matter content from density impossible.

The correlation between body density and chemical composition for higher vertebrates[3] is well known. It seemed both scientifically valuable[4] and possibly of considerable practical use to explore any similar relationships for fish muscle and fish body. Recent reports[5-8] have emphasized a strong correlation among compounds such as fat, water, ash and sometimes even protein for many fish species, both for whole fish and for fish muscle. It was logical to extend this approach to see if there is any mathematical valuable relation between density and any one of these compounds.

Materials and methods. The study was carried out on 120 pollan (*Coregonus pollan* Thompson) from Lough Neagh, N. Ireland, caught from January to August 1977. They were adult fish, 2-5 years old, 100-250 g individual weight.

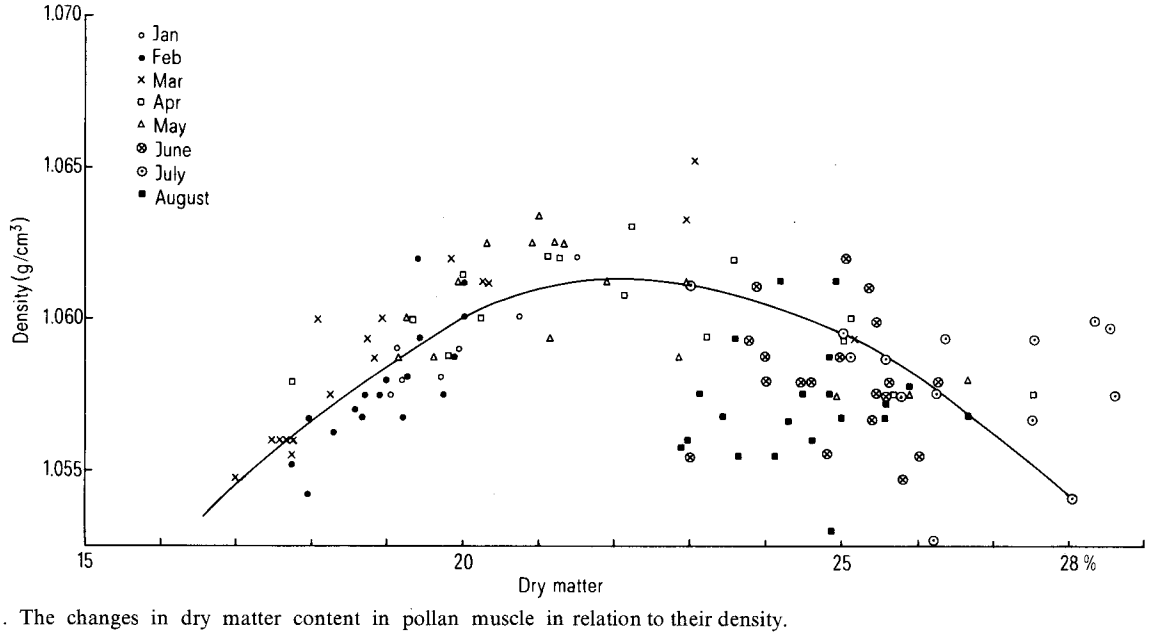

Fig. 1. The changes in dry matter content in pollan muscle in relation to their density.

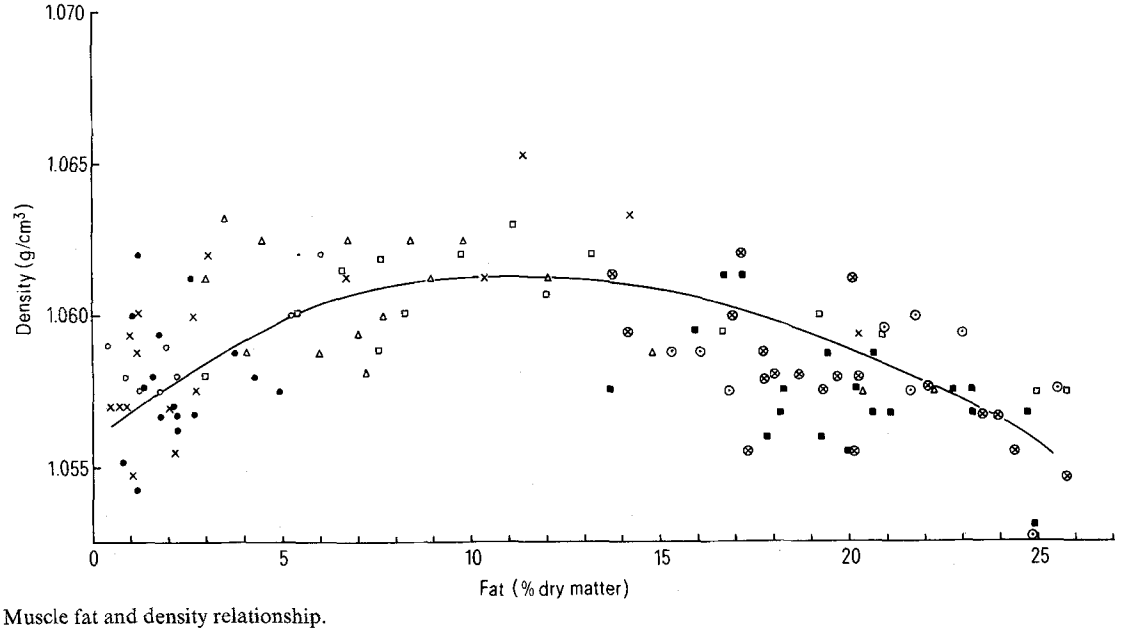

Fig. 2. Muscle fat and density relationship.

Directly after catching, samples (4-6 g wet wt) were taken from the upper part of the unscaled fillet behind the head. Density was determined, using a sodium chloride solution of known gradient concentration permitting resolution at 0.00075 increment of density. Water percent was determined after drying at 105 °C for 24 h, ash at 550 °C, crude fat by Soxhlet extraction. In the figures and in the text F = fat, W = water, A = ash, D = density, M = dry matter and P = protein.

Results and discussion. Figure 1 shows an unexpected relationship between density and dry matter. If the increase in dry matter is mainly due to an increase in fat, the relationship between 17 and 22.5% is opposite to that expected.

To this relationship was fitted the equation -

$D = 0.00982M - 0.0002199M^2 + 0.9514$

which makes proportional prediction impossible. The relationship between density and fat content (figure 2) has a similar character described by the equation -

$D = 0.000768F - 0.0000331F^2 + 0.05683$.

It is also very clear that there is an increase in dry matter (figure 1) and fat content (figure 2) in pollan muscle from January to August related to improved feeding conditions. But, because pollan spawn in November-December in Lough Neagh, after September changes in chemical composition of the muscle as well as their absolute weight are very different for the separate sexes. Females producing eggs lose fat drastically after September, males gradually until February (unpublished results). So, the results for September-December have a separate explanation connected with fish biology, and do not add anything to the presented relationships.

The well known relationship between fish water and fat also applies to pollan muscle (figure 3) which is very similar to other fish species when this relation is expressed in terms of correlation coefficient (brown trout $r = 0.980$ ($n = 121$)[5], tilapia $r = 0.887$ ($n = 58$)[7], mugil $r = 0.684$ ($n = 38$)[8], common carp $r = 0.868$ ($n = 80$)[9], perch $r = 0.818$ ($n = 398$)[10] and pollan $r = 0.938$ ($n = 120$)). So, prediction of fat and ash from water is confirmed for pollan, using the equations -

$F = 212.604 - 2.5847W$ ($r = 0.938$),

$F = 40.675 - 4.1337A$ ($r = 0.856$),

$A = -30.223 + 0.4788W$ ($r = 0.839$).

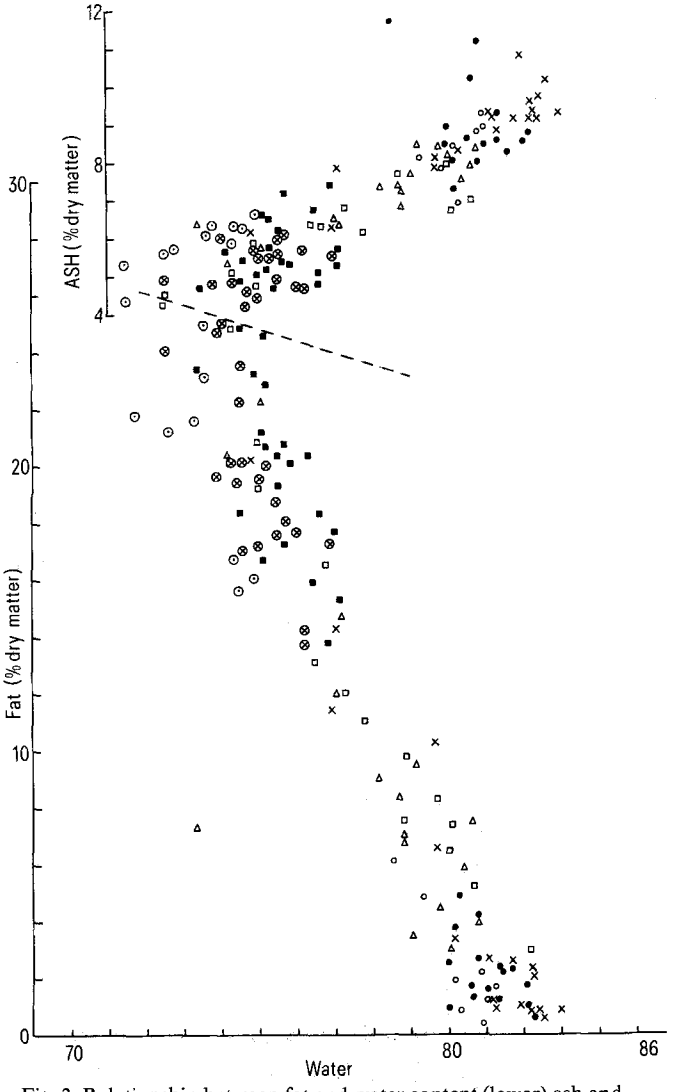

Fig. 3. Relationship between fat and water content (lower) ash and water content (upper) in pollan muscle (separated by dotted line).

It is worth mentioning that the chemical nature of the fat varies during the year[7] as does the ash composition resulting from selective mineral accumulation[4]. This relation is also affected by the kind of muscle; for example, red muscle from cod gives a strong water × fat correlation, in contrast to white muscle[6].

A knowledge of fat, ash and water content in fish muscle allows the prediction of protein content if the glycogen content is assumed to be negligible. In figure 4 the changes in the components of the muscle are shown on the basis of (A) wet and (B) dry matter. As a percentage of wet weight, protein decreases and water increases. However, expressed on a dry basis the reverse picture emerges which is opposite to the assumption made in the specific gravity calculation for non-fish animals, i.e., that non-fat substances are constant[3]. Assuming a specific gravity for fish fat (0.985 g/cm^3) and ash (4.37 g/cm^3), as well as Kleiber's[3] value for protein, the theoretical curve relating density and chemical composition was calculated. The density of pollan muscles calculated this way increases from 1.320 to 1.606 as the fat content decreases from 8.43 to 0.12% wet weight.

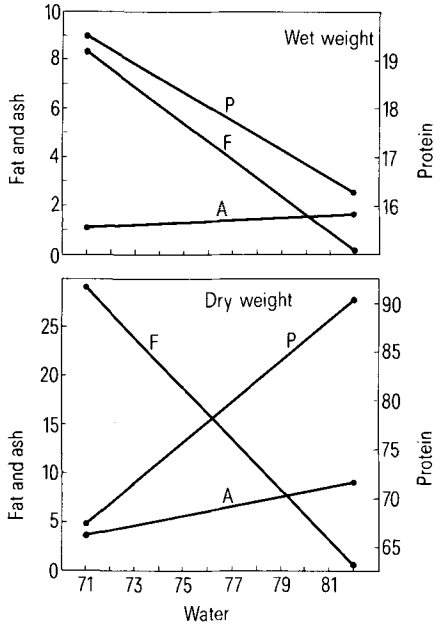

Fig. 4. The changes in water, fat and protein content in fish muscle expressed in wet (A) and dry (B) weight.

It has been reported[4] that cell size decreases and extracellular space increases as the relative water content rises during starvation of several fish species. These changes are most likely linked with the water bound to protein which can affect protein density itself. At the moment no explanation of the discrepancy between the experiment and theoretical figures can be offered, although more extensive studies elucidate the problem.

A recent report on salmon alevins[11] suggested a decrease in fish density from 1.067 at hatching to 1.044 at terminal yolk resorption. These changes correlated with the water content increase which is consistent with the idea that density is inversely proportional to fat content but the method of density measurement using glycerol creates a problem of fish drying out which the authors clearly recognized in their paper.

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Purification of acidic Z protein from human liver

K. Kamisaka, M. Hirano and M. Tsuru

The Second Department of Internal Medicine, University of Tokyo, Bunkyo-ku, Tokyo (Japan), 14 February 1978

Summary. Preparation of Z protein from human liver is described. Z protein consists of 2 forms which have different isoelectric points, pI 5.8 and pI 8.7, respectively. The acidic Z protein has a molecular weight of about 11,000 and has binding affinity for BSP using gel filtration.

One of the major functions of the liver is the transfer of organic anions such as bilirubin, sulfobromophthalein, several steroids and drugs from the plasma into the parenchymal cells where the acceptor proteins, such as ligandin and Z protein localized in the supernatant fractions, are important for the intracellular transport of these substances[1-4]. Rat Z protein was firstly described by Levi et al.[1] and Ketterer et al.[5] who designated it as aminoazodye-binding protein A. This protein has been further studied by Mishkin[6,7], Ockner[8,9], Ketterer[10,11] and others[12,13]. The aim of the present work was to determine the existence of the Z protein in the human liver and to characterize further its chemical and physical properties.

Materials and methods. Liver was taken from an autopsy specimen without hepatic involvement within 6 h after death and stored at −70 °C. After homogenization of the liver with 50% 0.25 M sucrose-phosphate buffer 0.01 M, pH 7.4, the solution was centrifuged for 90 min at 110,000 × g. The supernatant fraction was then applied to a DEAE column (Whatman DE-52, 5 × 40 cm) equilibrated with pH 7.5, 0.01 M phosphate buffer, and the eluted protein solution was concentrated and applied to a