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◆主要業績　　総数（2）件

・Multi-frequency bioelectrical impedance analysis of skin rubor with two-electrode technique for detection of initial pressure ulcer
J. Tissue Viability, 17, No.4, 110-114 (2008)。
T. Uchiyama, S. Ishigame, J. Niitsuma, Y. Aikawa, Y. Ohta
・Water Diffusion in Buckwheat Noodles and Wheat Noodles during Boiling and Holding as Determined from MRI and Rectangular Cylinder Diffusion Model
Food Sci. Technol. Res., 15, No.2, (2009).
I. Maeda, A. Horigane, M. Yoshida, Y. Aikawa

◆研究内容　／　Research Pursuits

蕎麦を茹でているとき、および、茹でたあとにおける蕎麦中水分の拡散と MRI’ 炎症部組織の生体電気インピーダンス

Water Diffusion in Buckwheat Noodles and Wheat Noodles during Boiling and
Holding as Determined from MRI and Rectangular Cylinder Diffusion Model Magnetic resonance imaging (MRI) was employed to observe water diffusion within two kinds of buckwheat noodles (marunuki, sarashina) and one kind of wheat noodle during boiling and holding. The apparent diffusion coefficients for water were statistically estimated with Fick’ s second law using a rectangular cylinder model, and the changes in moisture distribution in buckwheat and wheat noodles were compared quantitatively. Apparent diffusion coefficients of water in noodles during boiling were 4 to 7 × 10–6 cm2/sec. The diffusion coefficients of water in buckwheat noodles during boiling were higher than those in wheat noodles. For each noodle, the diffusion coefficients during holding after boiling were 2 to 3 × 10–7 cm2/sec and constant through the holding time, from 30 to 120 min. The diffusion coefficients in buckwheat noodles during holding were lower than those in wheat noodles. These results show that, as compared with wheat noodles, buckwheat noodles were boiled more rapidly but hardly lost favorable texture during holding.

Multi-frequency bioelectrical impedance analysis of skin rubor with two-electrode technique Skin rubor, or reddish discoloration on skin, is a sign of irritation. Physiologically it involves temporary vasodilation and hyperaemia in tissue, and is diagnosed by the visible characteristics.

◆教育内容　／　Educational Pursuits

(1) 數學・物理學分野
學部の 1、2 年生には微分・積分、級数展開、線型代数、ベクトル解析、質点の力学、剛体の力学を教えた。3 年生には、環境物理學を教えた。4 年生には、材料力學を教えた。
大學院學生には、フーリエ解析 (アラマノヴィッチ「数理物理学入門」東京図書)、拡散方程式の解法 (J. Crank, The Mathematics of Diffusion, Clarendon Press) などを教えた。
(2) 化學・生物學分野
學部 2 年生に生化學の基礎を教えた (Voet)。
大學院學生には、組織学 (Gartner & Hiatt) と、生理學 (Berne & Levy) と、分子生物學の基礎 (" Molecular Biology of THE CELL", Garland Science) を教えた。
(3) 情報工学分野
學部 3 年生に Unix, Emacs, TeX, C, M (Octave + GnuPlot), Ruby 等の使用法を教えた。
(4) 大學院博士後期課程學生の研究指導
現象のモデル作製、ならびに式による表現を指導した。また、英文論文作成を指導した。

1. Mathematics and physics
(1) For the first and second year students in undergraduate school: differentiation and integration, series expansion, linear algebra, vector analysis, mass point and rigid body mechanics
(2) For the third year students in undergraduate school: Environmental physics
(3) For the fourth year students in undergraduate school: Material mechanics
(4) For the students in graduate school: Fourier analysis (Aramanovich, "Introduction of Mathematical Physics", Tokyo Tosho), solution for diffusion equation (J. Crank, The Mathematics of Diffusion, Clarendon Press)
2. Chemistry and biochemistry
(1) For the second year students in undergraduate school: Biochemistry (Voet & Pratt, "Fundamentals of Biochemistry", JW & S)
(2) For the students in graduate school: Histology (Gartner & Hiatt, "Color Textbook of Histology"), Physiology (Berne & Levy, "Principles of Physiology"), introduction of molecular biology (" Molecular Biology of THE CELL", Garland Science)
3. Information engineering
(1) For the third year students in undergraduate school: Unix, Emacs, TeX, C, M (Octave + GnuPlot), Ruby