Vi har netop modtaget nedenstående interessante afhandling om mandler og gløgg. Normalt bringer vi kun artikler på nordiske sprog, men denne ville miste en del af sin videnskabelige charme ved at blive oversat – så vi gør en undtagelse!

The Role of the Almond Density in Quality Assessment of Gloegg. I.

A New Method for the Experimental Determination of Critical Almond Properties.

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Abstract
A novel method for the determination of almond density is introduced and its relevance with respect to the quality assessment of gloegg is discussed. Important conclusions are drawn. Theories, tables, illustrations and, last but not least, a number of innovative abbreviations are presented.

Introduction

A well-known problem of a periodically occuring nature is the problem of how to accurately determine the quality of the Christmas gloegg. It is important to know not only the taste of the gloegg, but also its alcohol content, of particular relevance in connection with the seasonal "julefrokost". Traditional analytical methods, such as chromatographic methods or enzymatic kit determinations suffer from their complexity and long response times. There is therefore a definite need for a fast inexpensive and acccurate analysis method. A number of groups have realized that densitometric methods could prove useful, since they are cheap and do not require a lot of training. However, standard densitometric methods are not fast enough. What is needed is not an off-line method, but rather a method that can be used *in gloeggo*. In this paper a novel principle to determine the density of gloegg is introduced. The method is based on an internal densitometric standard; the almond. This first paper concerns preliminary studies in which the internal standard, the almond, is characterized.

Theory

In order to determine the critical gloegg properties from almond observations, one needs an accurate description of the dynamic dropping of an almond into a gloegg fluid. If the gloegg is regarded as an incompressible medium, the system can be described by the Navier-Stokes equation [1]. In tensor notation this is:

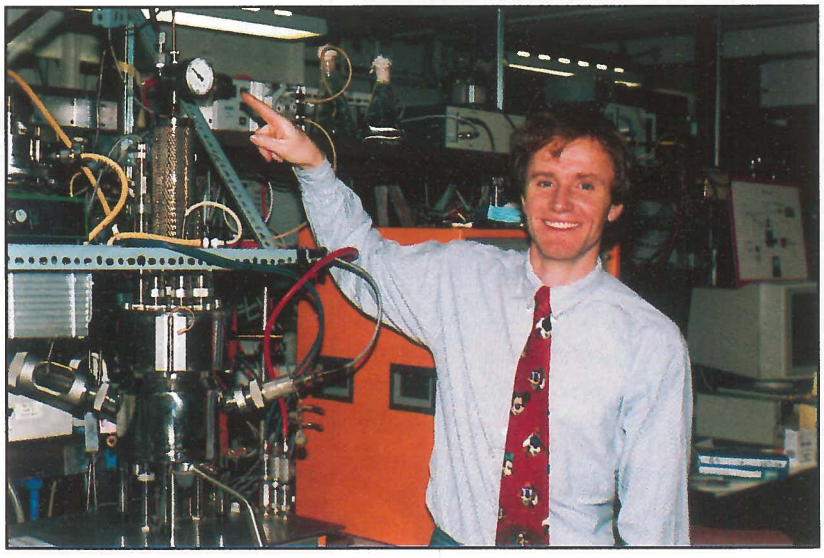
$$\rho \frac{Du}{Dt} = -\nabla p + \mu \nabla^2 u + \rho g \quad (1)$$

The choice of coordinate system is obviously critical. To be able to define the boundary conditions properly, almond fitted coordinates (ALF) should be used. The geometry of an almond is fairly complex, but can readily be described using the fractal theory of Mandelbrot [2]. Curiously enough, the meaning of the Swedo-German word "Mandelbrot" is "almond-bread". The derivation of the ALF form of Eqn. (1) unfortunately requires very tedious calculations and numerical problems will arise a.s. (almost surely) [3]. As a first approximation, the almond is therefore regarded as a hazelnut, a common Christmas candy with very similar properties, such as taste and surface structure. The hazelnut is also known to be almost perfectly spherical, except for the very rare "Philippin" species, which can be neglected for the purpose of this study.

Another problem, which complicates the analysis of the system at hand is the rapid change of flow regime. At the time of impact (TOI), i.e. the instant when the almond hits the gloegg surface, the Reynolds number is very high and the flow pattern is in the turbulent regime. The limiting solution as time tends to infinity corresponds to an entirely different situation, since in this case the almond will be in an equilibrium state, either floating freely at the liquid-gas interface or lying stationary at the liquid-solid interface at the bottom due to gravitational forces. This is of course an extreme creeping flow situation, and the fast transient in the characteristics of the flow prohibits the use of any standard approximation technique for solving Eqn. (1). It was therefore decided not to solve Eqn. (1).

Experimental

Solving the problem from first principles was, as shown in the previous section, not re-



Ill 1. Researcher E. S. Asplund in front of a piece of highly sophisticated equipment (not necessarily used in this work).