TechWizard reveals food secrets

By Anny Dentener

Package: TechWizard, version 2b-34
Function: Least-cost formulation, ice cream freezing,
reverse engineering, nutrition calculation and labelling
Website: www.owlsoft.com
Rating: ✪✪✪ (out of five stars)

If you thought your formulations were secure and hard to copy by the competition, think again. It took me less than 10 minutes to work out the basic formulation of a commercial milk freeze with TechWizard's "Label to Spec" reverse engineering module. After entering the nutrition label information and the ingredients listed (plus water), the "Formulator" section of the software took only 10 seconds to come up with the most likely formulation. Of course after that there are still the stabilising system, flavour and colour to select to complete the formulation.

Opening TechWizard clearly shows how the software has been developed based on the Excel spreadsheet lay-out. The programme has its origins in ice cream freezing calculations and has grown from there. Unfortunately, there is a very steep learning curve, with options hidden under several menus on different worksheets. It is essential therefore to work through the automated Frozen Desserts and Cultured Foods Examples, given in Help.

The "least-cost formulation" part of the software is based on linear optimisation. After choosing the possible ingredients including their usage limits and costs, you select the properties that you want to achieve with the formulation (Figure 1). For ice cream this principally means balancing the relative sweetness and sucrose equivalents, the main determinant of the freezing point. These values are entered as ingredient properties in the database. The Help file provides lists of both, although it is confusing that it lists sucrose equivalents as relative to 1.00 whereas I found

out that they need to be entered as relative to 100 to work properly. I have been informed that this will be fixed in version 3. The "Price Editor" can convert metric costs, but the formulation sheet will still list it in $/lb. A metric option here would be welcome.

Figure 1: TechWizard software showing the formulation sheet with ingredient and properties selections.

Own ingredients can be added to the database and formulas can become an ingredient with the "sub-formula" option. Other nutrition characteristics such as vitamins and minerals can be entered for the optimisation as long as they are listed as properties for all the ingredients selected. Overall it is possible to do the optimisation for 40 ingredients and 40 properties, an attractive option for complicated nutritional products.

After entering all the necessary information the "Formulator" only takes a few seconds to come up with a possible formulation. At times it might not be possible to achieve all the objectives and the programme indicates this as "Formulation does not meet all constraints". It further highlights in different colours which ingredients and/or properties are at their minimum or maximum. It shows freezing characteristics related to production, serving and freeze-thaw on distribution. Once a product is formulated the nutrition profile can be

evaluated, including % Daily Values and the contribution of each ingredient to a nutrient. After selecting the serving size, a standard US nutrition label can be viewed and printed off.
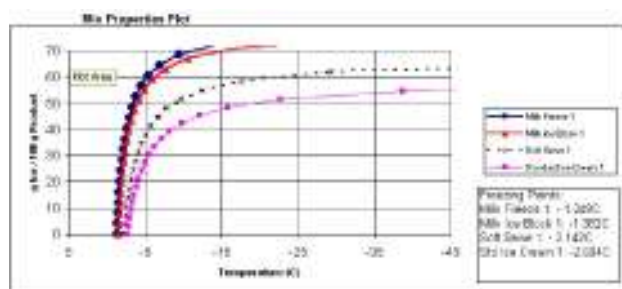

Figure 2: Freezing curves for milk ice blocks, soft serve and ice cream.

Comparing up to 4 plots of ice cream freezing curves in the "Mix Physical Properties" sheet (with metric option) is one of the most useful tools for ice cream makers (see Figure 2). When evaluating changes the "Normalise" function brings a formula back to 100%. The formulation continues to the batching stage, and there is an option to evaluate how much rounding off to whole units will affect this. Allowance can be made for the inclusion of flush water and "rework" (melted ice cream left-overs). The "Use It Up" option means you can calculate a batch around one limiting ingredient. A sub-section deals with how to adjust the mix over-run to compensate for the inclusion of dense materials, as diverse as Caramel Fudge Ripple or Chocolate Chips. The "Mix Calculator" allows standardising of any dairy product on fat and milk-solids-non-fat from different dairy materials.

Missing in the software are a lactose index, an indication of the optimum homogenisation pressure for the fat level chosen, and a calculation of the grams of food solids per litre of finished ice cream. The last parameter needs to be checked to ensure compliance with the proposed ANZFA ice cream regulations.

The earlier mentioned reverse engineering option gives more accurate and faster answers than my old "trial and error" spreadsheets but be warned. Firstly, with more complicated products there is often more than one "right" answer. Secondly, as I have discovered, some nutrition labels and/or ingredient listings seem to have errors even when allowing for variances in raw material composition.

Talking with a few TechWizard users supported my assessment that the software takes quite a while to get used to. However, they and I have found the back-up from the company excellent, with quick feedback by e-mail for me when I managed to corrupt an ingredient file. TechWizard software is presented to participants of the well known Penn State Ice Cream Short Course (www.cas.psu.edu). Warning: This software is no substitute for proper ice cream training. It is a tool for those with at least some ice cream knowledge, even though the software has extensive Help manuals with formulation and ingredient information.

If you are an ice cream maker or a supplier to that industry I suggest you have a serious look at TechWizard. As far as I am aware it is the only ice cream software world-wide. The "Least-cost" formulation and reverse engineering options also make it an interesting proposal for other sectors of the food industry. The nutrition calculation part is less attractive with the lack of information on NZ foods, but they can be entered manually into the database. The main drawback of TechWizard is its cumbersome interface.

Company: Owl Software run by Dr Ann Roland and Dr Lance Phillips.
Cost: Single User copy US$1,250 plus USDA database $500 (optional extra)
Lease option: US$60 per month, 1 year's subscription credited on full purchase
System requirements: Computer must have Microsoft Excel 97 or Excel 2000
Evaluation CDs are available.

Anny Dentener is an independent Food Technology Consultant and a founding member of the FoodInc Consulting Group (www.foodinc.co.nz/).
Contact: anny.dentener@xtra.co.nz