Who is Partnering with Forbes Medi-Tech?

Analysis of available information
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Overview

Forbes Medi-Tech, a Canadian biotechnology company, has patented a cholesterol-lowering food additive called Phytrol. Phytrol is made from tall oil, a waste product of paper production. Forbes has also patented the use of tall oils in the production of other pharmaceuticals. In August 1997, they announced their partnership with õone of the largest world-wide food producersò to use Phytrol in food products. The first such product will be margarine and will be available in Q3 1998. Forbes did not specify in which country it would first appear. This news followed the European introduction of Benecol, a competing cholesterol-lowering margarine from Finland, which now sells for US$4 per pound.

The two most significant sources of information on Forbesô mystery partner are the **8/97 Radio Monaco interview** and the **11/97 Golden Capital report**. Together with other known information, Bestfoods (formerly CPC International) appears as the most likely suspect. However, since Unilever is the worldôs largest margarine producer, they are an obvious suspect. Unilever would also have a strong interest in other tall oil-derived compounds for non-food products. The possibility of Nestle, Beatrice and Procter & Gamble as Forbesô partner has been discussed in previous reports. This report will review the evidence for the two companies I consider the most likely suspects, Unilever and Bestfoods.

Review of significant information

Status of Forbes / partner negotiations 11/97

In an 11/11/97 report, Golden Capital Securities, a Canadian broker and trust, outlined the status of negotiations between Forbes Medi-Tech and its partner. Some of the points were:

- Phytrol will enter the market Q3 1998 (in which country was not specified).
- "[In negotiations a] number of logistical issues have yet to be resolved, such asé ò
    1) "which company will manufacture Phytrol"
    2) "what the upfront licensing fee will be"
    3) "what sort of royalties on sales are involved"
    4) "whether or not a forest company should be included as a joint venture partner to gain access to the raw materials."
- "The food manufacturer has an exclusive right to license Phytrol for certain food products ***but not for others***. [my emphasis] The door is open for Forbes to conduct negotiations with other food manufacturers for these remaining products, although to date no formal negotiations have taken place."

- A pharmaceutical company in Slovakia, Slovakofarma, will convert tall oil into phytosterols. This is the first step in producing Phytrol. The Bulgarian pharmaceutical firm Antibiotic Company will ferment the phytosterols to produce androstenedione (AD), the precursor of Phytrol. "In order to convert AD into end products, it would have to be ***shipped to another facility*** [my emphasis] better equipped to undertake the necessary processing, such as Slovakofarma."


111197.doc

Attached is the Golden Capital Securities report (http://forbesmedi-tech.com/research/golden_capital_111197.html)

Radio Monaco interview

On 8/12/97, two officials of Forbes Medi-Tech were interviewed on Radio Monaco. They were Jack Miller, VP of New Business Development and Dr. Dwight Peretz, a member of Forbesômedical advisory committee. For the RealAudio file of that interview, see Forbesôs website at http://www.forbesmedi-tech.com/research/media.html. In that interview, Mr. Miller said that Forbes had signed an agreement with õone of the largest world-wide food producersòto develop a cholesterol-lowering margarine. He also gave a significant clue to the identity of that company: Phytrol will be used first in a **margarine**, then in a **peanut butter** and a **dressing**.

Dr. Peretz and Mr. Miller also said that 40,000-liter tanks are needed to process tall oil and that Central Europe is the only place where such capacity currently exists. The tall oil is converted into androstenedione (AD) and other compounds using genetically-engineered bacteria. AD is then used to produce Phytrol using other methods.

Key indicators of Forbes' partner

From the Golden Capital Securities report and the Radio Monaco interview, I have identified the following indicators of the company partnering with Forbes Medi-Tech on the cholesterol-lowering margarine:

1. The partner either can produce Phytrol or has links to a company that does.

2. The partner either owns a forest company or has a vested interest in one.

3. The partner produces all three products listed in the Radio Monaco interview: margarine, peanut butter and dressing.

Phytrol capability indicator

If Forbes and its partner are discussing which company will produce Phytrol, the partner must not be completely satisfied with Slovakofarma, with whom Forbes has a partnership. Besides vendor quality, the partner would also have to consider political, financial and labor stability in the source country. Furthermore, if the partner can determine which company produces Phytrol, it could potentially influence Phytrolôs use in other companiesôproducts or even profit from it. In any event, for the partner to consider dropping Slovakofarma less than a ten months before Phytrolôs Q3 98 introduction, it must have in mind one or more companies capable of exploiting the new technology. Therefore, one indicator of Forbesô partner would be either an in-house Phytrol capability or links to a company that does.

Vested interest in a forest company

On the question of partnering with a forest industry company, it is the partner, rather than Forbes, that is much more likely to have raised the issue. Forbes Medi-Tech is looking at its tall oil technology to be used in producing synthetic hormones, prescription cholesterol treatments and other drugs besides the Phytrol food additive. Forbes is unlikely to have negotiated their Letter of Agreement to allow the partner a say in who provides tall oil for all products. Therefore, the idea of partnering with a forest company must be coming from the partner. Furthermore, the idea that a partner is needed to secure a source of tall oil is spurious. Tall oil is an abundant waste product; Forbesô patent is predicated on that fact. Therefore, the partner must have a vested interest in a forest company to have proposed the idea.

The three listed products

It is understandable that Forbes would want margarine as the first product. That would allow them to cut into the proven and lucrative market position now held by Rasioôs Benecol margarine in Europe and soon to be introduced in the US through Johnson & Johnson. However, it would be strange for a biotechnology company to declare peanut butter and dressings as the next products. First, there are no such cholesterol-lowering products out on the market. Second, the fact that Phytrol needs fat for dispersal does not limit Phytrol to the three products listed. According to our food scientists, ice cream and cheese would be equally possible. Mr. Millerôs list of products must therefore be coming from the company or companies with which it is negotiating.

Mr. Millerôs list of products becomes more significant when you also consider the Golden Capital Securities report. That 11/97 report, issued three months after the Radio Monaco interview, said **Forbes was not negotiating with anyone else**. The choice of margarine, peanut butter and dressing for the introduction of Phytrol ***must therefore be from one company***.

Analysis of Unilever as possible partner

Unilever's links to Phytrol capability

In 1994, Unilever partnered with Danish pharmaceutical company Novo-Nordisk to build an ñenzymatic interesterification synthesis plantò in the Netherlands to ñproduce specialty triglyceridesò. The article in which this was reported, (attached below) also discusses how such a plant can be used to produce hormones as well as its precursors ñcholesterol and other steroids.ò Since Forbes has said that Phytrol works by blocking the cholesterol receptors in the intestine, it is not a great leap to conclude that the ability to produce synthetic cholesterol equates to an ability to produce Phytrol. So in 1994, Unilever did have the ability to produce Phytrol.

uni_ster.doc novo.doc

At left, ñUni_ster.docò is the article mentioning the Netherlands plant. ñNovo.docò discusses Novoôs entry into hormone replacements.

In 1997, however, Unilever sold its entire chemical and microbiology businesses. The British investment capital company CINVen bought the microbiological business in 1/97. Now called Oxoid Limited, it continues to produce media cultures such as bacteria. In 5/97 Imperial Chemical Industries (ICI) bought Unileverôs chemical division, which included Unichema, a producer of oleochemicals. With current

information, I do not know which purchaser now owns Unileverôs interest in the Novo-Nordisk-partnered plant (if Unilever did in fact sell that interest).

micrbio.doc chemsale.doc

At left, micrbio.doc is a press release on the Oxoid sale. Chemsale.doc is a news report on ICIôs purchase of the chemical businesses.

The companies Unilever sold do have very general links to tall oil technology:

- Unichema produces fatty acids, which can also be extracted from tall oil.
- Oxoid produces media cultures that include bacteria. Genetically-engineered bacteria are Forbesôcritical component in transforming tall oil into useful products.

However, without knowing either how Forbes produces Phytrol or to whom Unilever sold its interest in the Netherlands plants (if it did), we can neither confirm nor deny that either Unichema or Oxoid can produce Phytrol.

We do know Unilever no longer has a vested interest in either company, barring any secret agreements. If Unilever were partnering with Forbes Medi-Tech ***and*** either Unichema or Oxoid could produce Phytrol, we would not expect Unilever to sell those two businesses while trying to win the right to produce Phytrol. As it is, the last of the two Unilever sales was in 5/97, six months after which Golden Capital Securities reported the partner was negotiating who would produce Phytrol. At the very least, Unilever might have spun-off the businesses to stockholders so they could profit from Phytrol production. However, Unilever sold the companies outright. This weakens the argument that Unilever is the partner.

Unilever said the reason for the Oxoid sale was to focus the parent, Unipath, on its consumer goods business. Unipathôs products include contraceptives, which Forbes has said its tall oil technology could produce at much lower cost (http://www.forbesmedi-tech.com/technology/higher_value_steroids.html). So in addition to food, Unilever would have another strong motive to partner with Forbes. It would also explain its 1994 partnership with Novo-Nordisk on the Netherlands plant.

The key to confirming or denying Unileverôs association with a potential Phytrol producer is to learn who now owns the Netherlands plant and if there is any current relationship between Unilever and Novo-Nordisk. Until we learn that, we cannot dismiss Unilever as a suspect.

Of this much we can be certain: through its partnership with Novo-Nordisk, Unilever did have a Phytrol capability in 1994. It also has two strong motives for partnering with Forbes Medi-Tech: functional foods and lower materiel costs for contraceptives.

Dubois Paper Technologies: Unilever's forest link

Unilever owns a company in Canada called Dubois Paper Technologies. According to their website, their product line consists of

> "a wide range of specialty chemical products for use in pulp and paper applications. From paper machine cleaners to biological control, [they] include non-caustic cleaners and products that deal effectively with the use of secondary fiber and the need for deposit control."

No mention was made of any other products, present or future, other than those needed for cleaning. Their website is at http://www.dubois-paper.com. If Unilever is Forbesô partner, it may have been through Dubois that they learned of Forbesô novel use of paper pulping waste.

The process of ***cleaning*** pulping waste products may not be far removed from ***processing*** them into the precursor of Phytrol or Phytrol itself. However, to make Dubois capable of producing food-grade material would require significant changes in equipment, personnel and procedures. As a result, it is not a likely producer of Phytrol.

Dubois could be a source of tall oil, however. Duboisôcleaning products business gives it the relationships and possibly the infrastructure needed to secure tall oil. Although Unilever owns Dubois, it could want Dubois to enter into the partnership in order to increase Duboisôsale value; Unileverôs habit of buying and selling businesses is well known. Therefore, if Unilever is the partner, Dubois could provide the motive for proposing a partnership with a forest company.

Unilever's products: margarine, but not peanut butter or dressings

Of the three products listed in the Radio Monaco interview, Unilever produces only one: margarine (see http://www.unilever.com/public/brands/foods/bra_food.htm for a full list of Unilever products). Its margarine brands include Shedôs Spread, I Canôt Believe Itôs Not Butter and Imperial. Through its Lipton operating company, Unilever is the largest margarine producer in the world.

Summation of Unilever as possible Forbes partner

To review, our three key indicators of Forbesômystery partner are:

1. The partner either can produce Phytrol or has links to a company that does.

2. The partner either owns a forest company or has a vested interest in one.

3. The partner produces all three products listed in the Radio Monaco interview: margarine, peanut butter and dressing.

Unilever falls short on some of the indicators:

- Unilever does not appear to be able to present itself as a Phytrol producer having apparently sold any capability it may have had. Similarly, it does not appear to have links to anyone that does. However, we cannot be certain of this without knowing who now owns the plant in which Unilever partnered with Novo-Nordisk.

- Unilever owns a company that could secure a source of tall oil, Dubois Paper Technologies. This would give Unilever a reason to discuss a partnership with a forest company.

- Unilever produces margarine, but not peanut butter or dressings.

Although it falls short, Unilever would have a very strong interest in partnering with Forbes beyond functional food. There are also several significant unknowns that prevent us from dismissing it as a suspect.

Analysis of Bestfoods as possible partner

Bestfoods' links to Phytrol production

The closest chemical processing capability Bestfoods has is its shareholdersô stake in **Corn Products International** (CPI), a corn oil refinery it spun-off to shareholders on 1/1/98. Research by the USDA shows that CPI could produce Phytrol.

In 1995, Dr. Robert A. Moreau of the USDA Eastern Regional Research Center applied for a patent for a method of extracting phytosterols from corn fiber. "The ferulate-phytosterol esters (FPEs) in corn are unique in that the major phytosterol moiety is sitostanol" and "hexane extraction of corn fiber yields an oil that contains significant levels (about 6 wt.%) of ferulate-phytosterol esters". According to our own food scientists, Phytrol falls under the classification of a sitostanol.

Moreau also says, "Corn fiber oil is a value-added product that can be obtained from the fiber ***through application of conventional extraction processes***" [my emphasis].ò Moreau applied for a patent on 12/8/95 (#08/569,473) and discusses his findings in the periodical Journal of Agriculture & Food Chemistry (44:2149-2154, 1996). If a conventional corn oil refiner (such as CPI) could produce phytosterols and sitostanols using corn, they may be able to do the same with other materials --- perhaps even the precursor for Phytrol.

Dr. Moreau also said "The patent application is ***available for licensing*** and the Eastern Regional Research Center is interested in exploring the possibilities of ***collaboration with a company on the further development of this product*** through a Cooperative Research and Development Agreement." [my emphasis].

moreau.doc cornrefn.doc

Attached here are an article Dr. Moreau wrote on his research and a synopsis of the corn refining process.

So while Bestfoods could not produce Phytrol itself, its shareholders own a company that could.

Bestfoods' links to the forest industry

Bestfoods has a close tie to a ñforest companyò--- International Paper. Since 1990, Charles R. Shoemate, Chairman, President and CEO of Bestfoods, has been on the Board of Directors of International Paper. If Bestfoods is Forbesô partner, this may have been how Bestfoods learned of Forbesô novel use of paper pulping waste. As a shareholder in International Paper, he would benefit if IP became a partner. Bestfoods might benefit through lower paper and packaging costs. For Mr. Shoemateô biography, see http://www.bestfoods.com/profile_bios_shoemate.htm.

Bestfoods: Only maker of all products listed by Forbes

There is only one company I found that produces margarine, peanut butter and dressings: **Bestfoods**. It makes Mazzola margarine and Skippy peanut butter. In dressings, it makes Hellmannôs and Bestfoodsô mayonnaise and salad dressings.

Although Bestfoods is a major player in the peanut butter and dressings market, Mazzola has long been an also-ran in the margarine market. According to our external manufacturing managers, Bestfoods has been trying to sell its margarine business for years. What little margarine it does produce is made entirely through copackers. Despite this gloomy picture, investing in a cholesterol-lowering margarine would be consistent with Bestfoods goal of growing by double-digit rates worldwide. Given the success of Rasiosô Benecol margarine in Europe, it would also appear to be a safe investment even for Mazzola.

Analysis of Bestfoods as possible Forbes partner

Our three key indicators of Forbesômystery partner are:

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2. The partner either owns a forest company or has a vested interest in one.

3. The partner produces all three products listed in the Radio Monaco interview: margarine, peanut butter and dressing.

Bestfoods is a strong match:

- Bestfoods has close links with a company capable of producing phytosterols like Phytrol: Corn Products International (CPI). Those links are through Bestfoodsôstockholders ownership of CPI.

- Bestfoods has a link to a forest company, International Paper, through the membership of its Chairman/President/CEO on IPôs Board of Directors.

- Bestfoods produces all three products Forbes said would introduce Phytrol.

With available information, Bestfoods appears much more likely than Unilever to be partnering with Forbes.

Findings

With information available as of 1/13/98, **Bestfoods** must be considered the prime suspect as the partner of Forbes Medi-Tech. However, Unilever would have such a compelling interest in Forbesôs tall oil technology for both its food and contraceptives business that we cannot dismiss it as a suspect with our current information. Also, before we eliminate Unilever as a suspect, we must discover who now owns their hormone plant in the Netherlands and what relationship the new owner has to Unilever.