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| Client: VAV Life Sciences         | Issue: 7 <sup>th</sup> May – 13 <sup>th</sup> May,12 |
| Magazine: The Mazada Pharma Guide | Page No: 90 & 92                                     |
| Edition/City:                     | Media Evaluation:                                    |

## COMPANY PROFILE

### Advances in technology have improved the versatility of natural phospholipids in functional foods

VAV Life Sciences is a pioneering name in the field of Active Pharmaceutical Ingredients (APIs), food ingredients and nutritional supplements. Started in 2003 by Mr Arun Kedia, himself a chemical engineer, the company has carved a niche for itself by developing cutting edge products and services to improve the health and quality of people's lives worldwide. VAV Life Sciences started as a company exporting chemicals & pharmaceuticals and continued to function like that till 2006. In 2007, winds of change hit and it diversified into biotechnology. Today, only about 5 per cent of its business comes from chemicals while a major chunk is from biotechnology. The company has been growing steadily offering products and services around the world to multinational companies and small concerns alike in the area of pharmaceuticals, nutraceuticals and the food industry. In a span of 9 years, VAV Life Sciences has achieved unprecedented response becoming an export centric company that boasts of almost 90 per cent of its sale out of India 57 per cent of which is to Europe. A part of the company also offers cost effective services in basic engineering and process technology in India as well as internationally. Its services range from process licensing, procurement assistance and commissioning. VAV also offers technical services in production of Liposomal pharmaceutical products.

The company's product range includes:

- OLEOVA ®: is natural, premium egg oil extracted from chicken eggs using modern technology. OLEOVA ® can be used in skin care products like moisturizers, lotions, sunscreens etc. and for haircare since it has superior nourishing and conditioning properties. OLEOVA ® is also used in products meant for the treatment of burns and wounds because of presence of excellent healing properties. It reduces scars, aids reepithelisation and inhibits bacterial growth at the wound site.
- Lecithins: used as emulsifiers in chocolates, confectionery, bakery products, beverage mixes etc.
- LECIVA ® Soya phospholipids used in pharmaceutical, cosmetic and health food industries, as dietary supplement in soft gel capsules, protein drinks formulations and targeted drug delivery systems.
- LIPOVA ® Egg phospholipids used in nutritional supplements, infant formulae and injectable pharmaceuticals.
- Natural extracts: Provide a more consistent, stronger and more effective product that bears more characteristics of the plant constituents.
- Spice Oleoresins: are obtained through powdered dried spices. Oleoresins are economical as 100 kilos of raw spice can be replaced by very few kilos of Oleoresins.

VAV manufactures certified organic spice oleoresins. Oleoresins are manufactured with super critical process thus eliminating solvents, pesticide residues and heavy metals. This process is towards VAV's endeavour towards natural products for a healthy life.

- Active pharmaceutical bulk drugs which are used in manufacturing of a variety of medications used in cancer therapy, cholesterol management, hormone replacement therapy, dermatology, cardiovascular disease management etc.

VAV Life Sciences boasts of a clientele of reputed pharmaceutical and nutraceutical companies as well collaborations with erudite scholars from abroad for research and studies. The company is now scaling up its infrastructure with a new c-GMP compliant manufacturing unit coming up in Vasai near Mumbai in 2012 which will manufacture high value biotech products.

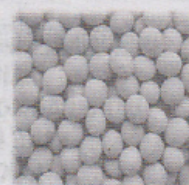
For Further Details, please contact: Carmine Communications  
Paroma Bhattacharya- 9702230147/paroma@carmine.co.in  
Mansi Sheth- 9870631556/mansi@carmine.co.in

Phospholipids are essential molecules that are found in cellular membranes. A cell in the human body cannot function normally without the presence of these phospholipids. As the name implies, phospholipids are made of the combination of lipids (fats) and the mineral phosphorus. These lipids are fundamental components of the cell membranes which are essential for growth, maturing and proper functioning of cells.

By administering phospholipids it is possible to improve membrane functions associated with membrane proteins and lipids. There are evidences from clinical studies that show a number of cases of metabolic imbalances that can be cured by intake of special polar lipids and phospholipids.

Although present in many foods, natural phospholipids are found in higher concentrations in soy, eggs, marine sources and the brain tissue of animals. Phospholipids are also the most nutritionally important constituents of soya lecithin.

**Natural soya-phospholipids:** Soya Phospholipids are regarded as versatile and functional ingredients of food. They are naturally occurring complex mixture of phospholipids of soya. The main phospholipids present in soya lecithin are Phosphatidylcholine (PC), phosphatidylethanolamine (PE), phosphatidylinositol (PI) and Phosphatidic Acid (PA). These are produced as a co-product during soyabean oil refining, sterilized and standardized.



Mixed phospholipids in powdered or granulated form produced by de-oiling natural soya phospholipids, are used orally since many years. With the EC regulations in Europe NON GMO Certified IP phospholipids are in demand from the food supplement industry in the interest of the consumers.

Powdered Lecithin (LECIVA-S25P) is used mainly for the production of food supplements in the form of tablets, hard gelatin capsules or nutritional premixes. Granular Lecithin (LECIVA-S25G) has also proved to be an effective and convenient form of administration around the world for many years since it can be consumed directly as a supplement or sprinkled on salads.

A health claim has been formulated for de-oiled lecithin (mixed phospholipids): "De-oiled soy lecithin may help to maintain a healthy cholesterol level from foods providing 6 g/day."

**Phosphatidylcholine:** Phosphatidylcholine produced by solvent fractionation of natural soya phospholipids using food grade solvents and green chemistry techniques, has been used successfully to treat liver diseases supported by various clinical studies. The most frequent of these are acute and chronic cirrhosis of the liver, fatty degeneration of the liver (steatosis, fatty liver) and liver damage from alcohol, chlorinated hydrocarbons, medicines etc. In cases of previous liver damage Phosphatidylcholine has brought about a marked improvement in the speed of recovery by repairing the cell membrane, renewal or regeneration of Liver parenchyma



The beneficial effect of Phosphatidylcholine on the liver is connected with its role as a central building block in the cell membrane.

Neurological disorders arising from a deficiency of the neurotransmitter

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acetylcholine can be treated by increasing the plasma choline level by oral administration of Phosphatidylcholine in capsule or tonic forms. Soya Phosphatidylcholine (LECIVA-S35) is a natural precursor of choline and thus of the synthesis of the neurotransmitter acetylcholine. An increased rate of synthesis is generally associated with an improvement of memory and muscle function.

In 1998, the Institute of Medicine (IOM) of the U. S. National Academy of Sciences identified choline as an essential nutrient and recommended daily intake amounts. And in 2001, the U.S. Food and Drug Administration (FDA) approved a nutrient content claim for choline, enabling food manufacturers to inform their consumers via the food label.

The recommended Average Intake (AI) for adults is 550 mg/day of choline for men and 425 mg/day for women. Choline in the diet could be available as free choline or bound as esters such as glycerophosphocholine, sphingomyelin, or phosphatidylcholine. Also in Europe Health Claims have been formulated especially for Phosphatidylcholine:

"Soya Phosphatidylcholine supports liver metabolism and may help detoxification from foods providing 1.2 g/day."

"Soya Phosphatidylcholine helps maintaining a healthy cholesterol level from foods providing 1.2g/day"

The bioavailability of Phosphatidylcholine is excellent and is suitable for raising the choline level in blood. Oral administration of Choline salts has undesirable side effects which may even increase the severity of existing liver damages. Phosphatidylcholine is safe to take without any problems, also in combination with other nutrients even due to the good emulsifying properties improving the adsorption of other nutrients administered with it.

Natural Phospholipids enriched with Phosphatidylcholine are available as liquid or waxy products suitable for formulations. Liquid Phosphatidylcholine (LECIVA-35) is used mainly in soft gelatin capsules, whereas waxy materials like

LECIVA-S50 and LECIVA-S70 can be used for pharmaceuticals or liposomal drug delivery systems.

**Egg Phospholipids:** In addition to significantly higher content of Phosphatidylcholine, egg phospholipids provide egg proteins which are the most balanced and complete set of amino acids found in nature and often missing from other protein sources. LIPOVA-E100 produced by solvent free extraction of egg yolk is a fat and cholesterol free powder suitable for tablets or hard shell encapsulation and proves to be an ideal nutritional aid for growing children/teenagers and sportsmen with needs for protein supplements. However, this product is not suitable for people allergic to eggs (anaphylaxis) or strict vegetarians/vegans.



**Glycerophosphorylcholine:** L-Alpha Glycerolphosphorylcholine (Alpha GPC, choline alfoscerate) derived from highly purified soya lecithin by a process of deacylation and chromatographic purification, is a natural choline compound found in the brain and in milk. It is used as dietary supplement to enhance memory and cognition. In an Italian multicentre clinical trial on patients suffering from recent stroke, they were supplemented GPC for five months. The trial confirmed the therapeutic role of alpha-GPC on the cognitive recovery of patients based on four measurement scales. GPC is extremely well absorbed and crosses the blood brain barrier where it supports brain function and learning processes by directly increasing the synthesis and secretion of acetylcholine. GPC also protects neurons and improves signal transmission by serving as a precursor to membrane phospholipids.

Commonly used doses are 300 - 500 mg daily, delivered through soft gel capsules.