Effects of Cataplex® D, Calcifood®, and Ostrophin PMG® on Markers of Bone Loss and Bone Formation
In this retrospective study, markers of bone health were reviewed for 11 subjects with osteopenia (decreased bone density) who had been taking a protocol of three Standard Process supplements.

**Protocol**
- Cataplex D | 1 tablet
- Calcifood | 6 wafers
- Ostrophin PMG® | 2 tablets

In addition to the proprietary Protomorphogen veal-bone extract, this protocol contains a unique blend of:

**Vitamins and Minerals**
- Vitamin A
- Vitamin D
- Calcium
- Magnesium

**Whole Food Ingredients**
- Wheat germ
- Veal and bovine bone
- Date
- Carrot
- Rice bran

To measure effect on bone mineral density, two markers associated with bone status, osteocalcin and DPD, were assessed by means of an initial sample and a final sample after three months of supplementation.

Produced by specialized cells, osteocalcin is a protein that helps build teeth and bone. Higher circulating levels of osteocalcin are correlated with increases in bone mineral density.

Circulating DPD is a marker of bone resorption, when bone is broken down by osteoclasts. The opportunity for bone loss arises if osteoclast action outpaces the deposit of new bone. Found within collagen, DPD provides strength to the collagen matrix. When collagen is broken down, the residue enters the bloodstream and is eliminated via urine.¹

**Cross-Section of Healthy Bone**

When bone is resorbed or broken down, osteoclasts (▲) dissolve the collagen matrix, releasing DPD, among other chemicals and minerals. Osteoblasts (▼) lay down new bone (osteoid ▲) that consists of collagen, hyaluronic acid, chondroitin sulfate, and osteocalcin. When an osteoblast is finished laying down bone the osteoblast becomes a lining cell (●).

   › Mean age of 62 at baseline; bone mineral density measured up to eight times over 13 years
   › Reported that osteocalcin, urinary creatinine-corrected free [DPD], and other markers were associated with bone loss.
Results
› Osteocalcin was unchanged during the study.
› Urinary DPD secretion decreased 18%.

Decreased DPD suggests that less bone was lost over the three months, and no change in osteocalcin further suggests a positive environment for bone formation.

Overview
The assessment of bone-turnover markers, when examined over time, can identify individuals who are naturally losing bone mass quickly or slowly. Clinically, markers like osteocalcin and DPD point to specific issues like the loss of bone mineral density in the leg, but these markers represent only part of the equation used by clinicians.²

The cycle of bone breakdown (resorption) and formation occurs continuously. Between age 18 and 26, the body has maxed out on bone growth for most of us, although we continue to add bone mass until around age 30.³ After age 30, bone mass begins to decrease naturally, and if resorption outpaces formation, bone density is lost.

There are a number of risk factors, some changeable and some not, that can affect an individual's rate of bone loss, and prevention appears to be the most effective strategy for maintaining bone density.

Prevention
It is well established that intake of both calcium and vitamin D are effective in supporting bone health, but a number of other nutrients may help maintain bone density as well.⁴

May Help
- Boron (raw avocado, nuts)
- Copper (organ meat, wheat bran)
- Iron (meat, vegetables)
- Isoflavones (legumes, soybeans)
- Magnesium (green leafy vegetables, oats)
- Manganese (nuts, legumes)
- Phosphorus (cheese, meat, eggs)
- Potassium (fruits, vegetables, fish)
- Protein (animal and plant sources)
- Vitamin C (citrus, cauliflower)
- Vitamin K (Brussels sprouts, cabbage)
- Zinc (red meat, nuts)

2. Osteoporos Int. 2007. 18(9):1297-1305.
› The Malmo Osteoporosis Prospective Risk Assessment study:
  601 women, age 75
› Annual bone mineral density change measured over five years

Unchangeable Risk Factors
- Female gender
- Increasing age
- Small body frame
- Caucasian or Asian ethnicity
- Family history

Modified Risk Factors
- Lifetime low consumption of calcium, vitamin D, fruits, vegetables
- Lack of exercise, consumption of alcohol, smoking
- Certain medications
- Low or abnormal sex-hormone levels