PermaNet ® 3.0 Mosquito Net Combination

Developing innovative products and concepts and saving lives
Introducing a New Technology

PermaNet ® 3.0 combo is a mosquito net that combines different technologies and fabrics with a highly improved bioefficacy
Composition and Structure

- The roof of PermaNet ® 3.0 is polyethylene fiber with 100 Denier monofilament composite containing a "synergist" and Deltamethrina embedded within the filament.

- The upper side of PermaNet ® 3.0 is a multifilament polyester fiber 75 Denier with a load of Deltamethrina of 85 mg/m2, which offers a better long-term protection.

- The lower side PermaNet ® 3.0 is a multifilament polyester fiber 75 Denier with a special design with the crown strengthened for added durability, with a cargo of 115 mg/m2 Deltamethrina.
Claim of the product

PermaNet ® 3.0 is a new generation of long lasting insecticidal treated mosquito nets (LLIN) that has an improved bioefficacy against malarial mosquitoes with resistance. The Net combines two polymers: polyester and polyethylene - and two chemicals: Deltamethrine and one called: "synergist (PBO) for an improved bioefficacy against malaria mosquitoes resistant to pyrethroid.

- **Quick regeneration of insecticide after multiple washes ensures highest efficiency during the life of the net.** Sides and roof of the net, regenerates 100% bioefficacy after a day with Anopheles stephensi unlike other polyethylene nets that can not undergo complete regeneration no later 15 days.

- **With a unique construction of the sides, based on the actual behavior of users, which ensures a longer life of the net.** The side panels PermaNet ® 3.0 comes with a border less than 70 cm with a "design" particular to strengthen the durability and life of mosquito in the field.

- **PermaNet ® 3.0 provides effective protection for more than 20 washings.** Research in the villages of tents shows that mortality rates of mosquitoes, with PermaNet ® 3.0 were significantly higher than with PermaNet ® 2.0 in areas where there were populations of mosquitoes resistant to malaria.
Observations on mosquito behavior have shown that the majority of mosquitoes falls (lands) on the ceiling of the first net, before coming down on the sides of the net.

The roof of PermaNet® 3.0 contain Deltamethrine and a synergistic (PBO); when a mosquito falls/lands on the roof, he/she has contact with two chemicals: Deltamethrine and synergistic.

The synergistic works in the following way:
- Increased ratio of insecticide penetration into the insect
- Inhibit the metabolic enzymes that the mosquito uses to kidnap or deconstruct in insecticide

Sides of the mosquito net and polyester, which is more mancio and comfortable for the user than polyethylene.
Effectiveness of Product

- PermaNet® 3.0 was given an interim recommendation as a long-lasting insecticidal network (LLIN) in the 12th meeting of WHOPES Working Group in December 2008.

- PermaNet® 3.0 was tested in experimental huts and baracas in several places in different countries.

- Data from two areas with vectors of malaria resistant to pyrethroid with different mechanisms of resistance will be presented and discussed in brief:
  - Burkina Faso: resistance kdr
  - Cameroon: metabolic resistance
**Efficacy Results: Experimental Baracas with Resistant Malaria Vectors**

**Mortality data**

- Mortality rates in Burkina Faso, an area with a high frequency of mutation KDR was significantly higher with PermaNet ® 3.0 washed and not washed as compared to PermaNet ® 2.0 washed and not washed.

- Mortality rates in Cameroon, an area with metabolic resistance was significantly higher with PermaNet ® 3.0 washed and not washed with PermaNet ® 2.0 washed and not washed.

- In both countries, PermaNet ® 3.0 washed 20 times had a result better than PermaNet ® 2.0 not washed.

Graph to show overall mortality (%) of wild, free-flying, pyrethroid-resistant *Anopheles* populations caught in experimental huts at two test sites. Error bars show 95% confidence limits. Letters indicate results from statistical comparisons; data from one test site sharing the same letter do not differ significantly (P>0.05).

*PermaNet ® 3.0 had significantly better results than PermaNet ® 2.0 resistant search sites.*
Increased Service Package (ARQ value)

- The ARQ monitoring program is a service that will be provided without additional costs in the case of large orders * of PermaNet ® 3.0. The program incorporates three elements with the aim of monitoring the "performance" (performance) of PermaNet ® 3.0 on local conditions:
  - Acceptance: Acceptance of mosquito nets of residents/users
  - The resistance to insecticides: monitoring of local populations of the vector
  - Quality Assurance: Monitoring physical and chemical status of insecticides

- Each ARQ monitoring program will be implemented at each site over a period of three years.

*the discretion of the manufacturer