PermaNet ® 3.0 Mosquito Net Combination






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VESTERGAARD FRANDSEN
DISEASE CONTROL TEXTILES
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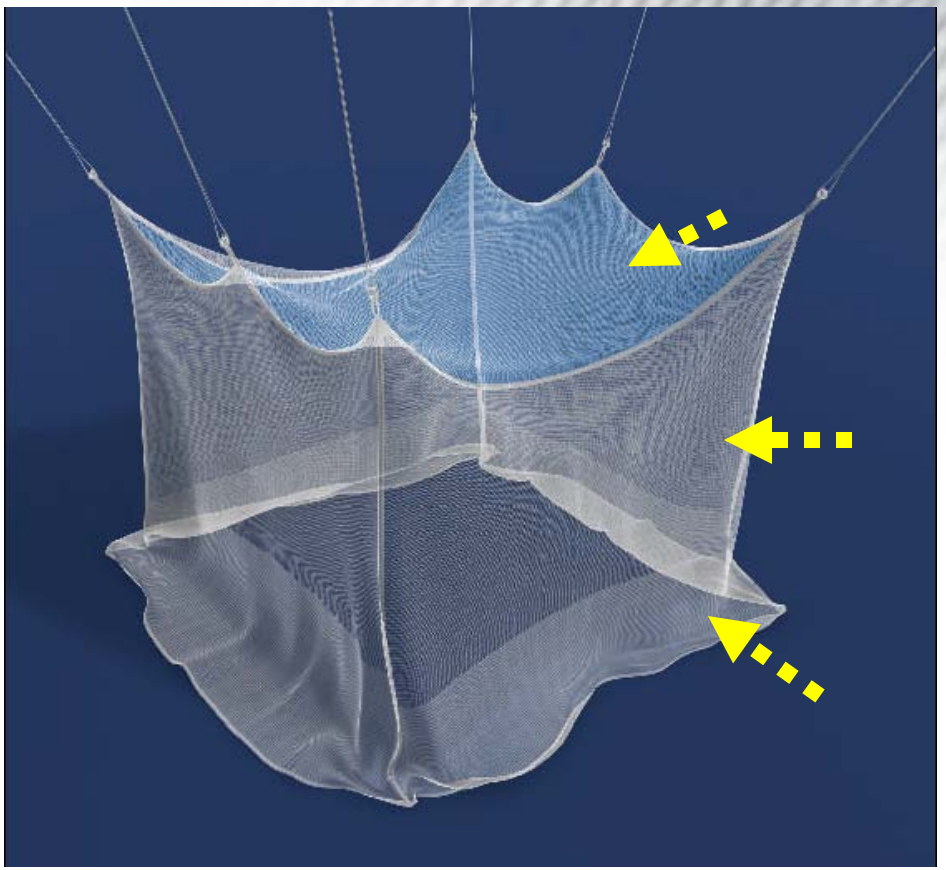
Introducing a New Technology

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 later15 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.

Working Principle

- 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 which is more mancio and comfortable for the user that polyethylene.

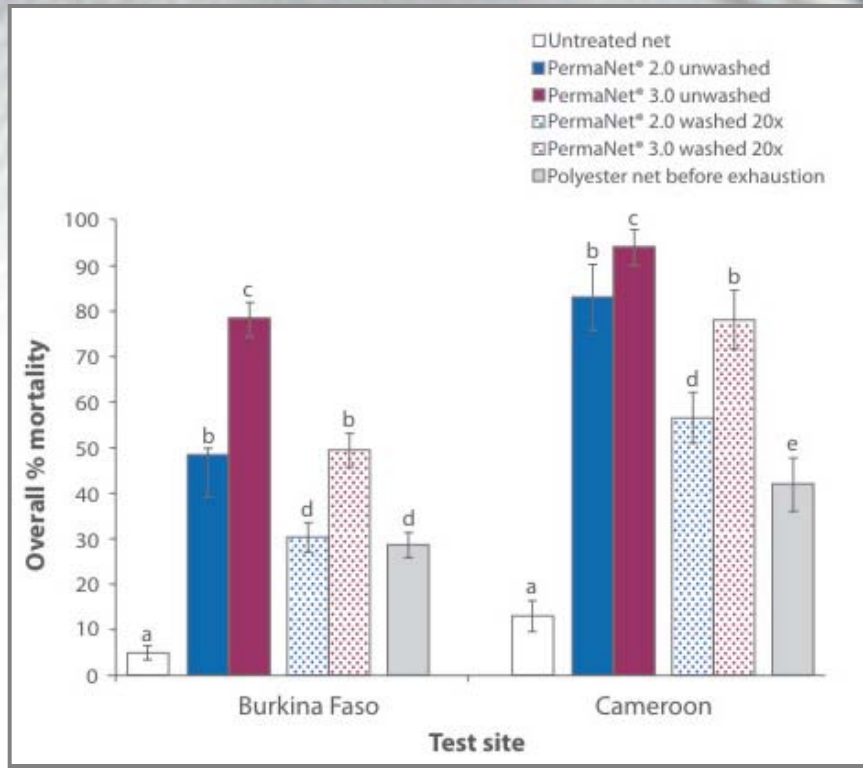
Effectiveness of Product

- 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



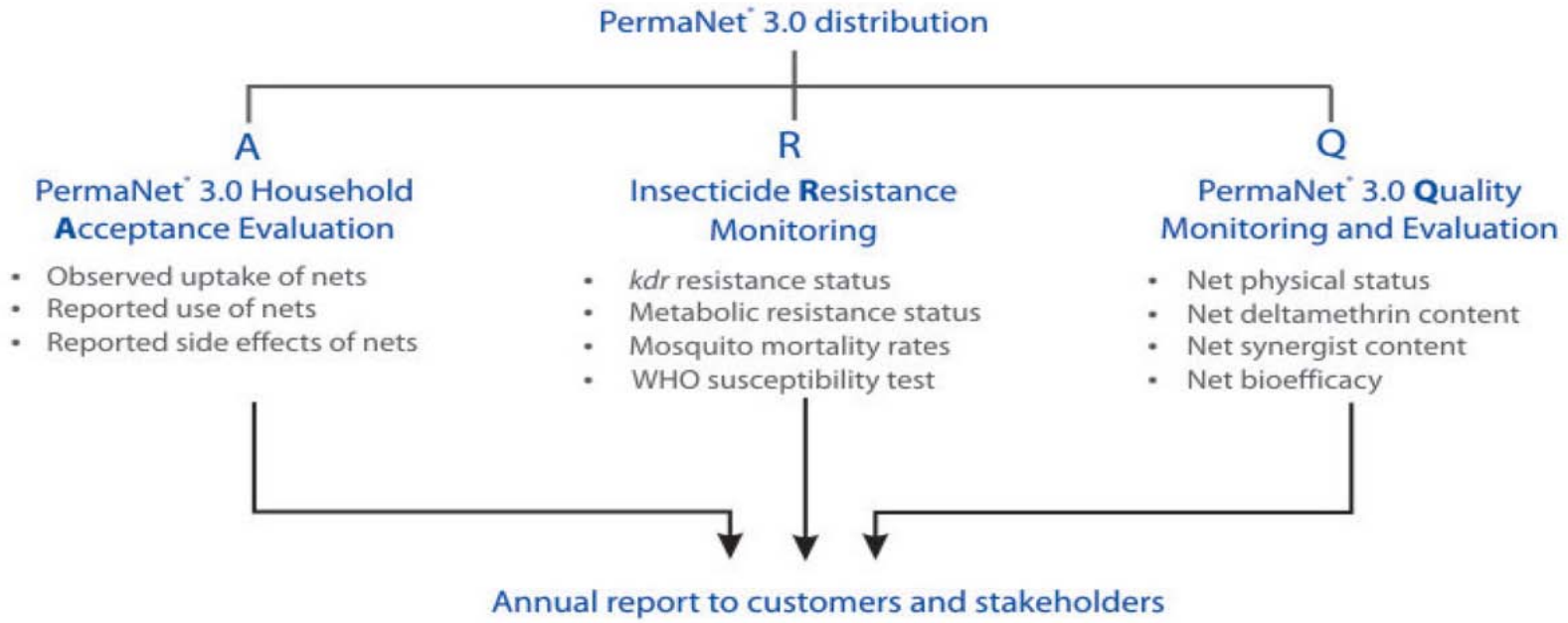
Graph to show overall mortality (%) of wild, free-flying, pyrethroid-resistant *Anopheles* populations caught in experimental huts at two test sites. Error bars show 95% confidence limits. Letters indicate results from statistical comparisons; data from one test site sharing the same letter do not differ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



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