Measuring Nutrients Where It Matters

Improving Nutrition Along the Value Chain

TOP 100 INNOVATOR 2014

Development, manufacture and sales of all BioAnalyt test kits (devices, reagent vials) are carried out in accordance with ISO 9001:2015 and have been certified by TÜV NORD, Germany.

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Improving Nutrition **Along the Value Chain**

At BioAnalyt, we believe simple ideas solve big problems. To ensure a nutrition program has impact, the target nutrients must reach the tables of the women and children that need it most. This means measuring nutrients at every point of the food value chain.

By taking the lab out of the analysis and the complex out of the measurement, we have developed rapid testing solutions that do exactly this. In collaboration with our partners, we enable the improvement of nutrition along the value chain.

Raw Materials

- Delivering a high-yield, vitamin-rich variety of cassava by **speeding up the breeding** of roots rich in provitamin A (HarvestPlus)

Food Production

- Keeping **1 billion fortified bouillon** cubes affordable (GB Foods)
- Ensuring that **5.4 million households** in Ghana get quality cooking oil fortified with vitamin A (Wilmar)

Market

- Using evidence through measurement to **build trust** between **industry and food control** (UNICEF, NAFDAC, SON)
- Sharing **technical know-how** through hands-on trainings to build monitoring capacity (WFP, MoT)

Households

- **Assessing coverage** of large-scale food fortification to **improve impact** (Global Alliance for Improved Nutrition)

Population

- Engaging 4,000 households in a nutrition survey to **encourage behavior change** (Helen Keller International)
- Enabling rapid in-field testing of nutrients in breast milk to **track the impact of micronutrient-rich** food consumption (CHORI)

Nigeria, Cameroon & Ghana

The Yellowest Shrub

Bringing biofortified cassava to as many people as possible

"Making sure we have quality data is very important, because based on that measurement we decide which progeny is selected & which breeding techniques to deploy."

Elizabeth Parkes, *Cassava Breeder, HarvestPlus*

The challenge

The vision of HarvestPlus is to reduce child malnutrition by 30% in Africa by 2020. Cassava is a starchy shrub whose carbohydrate-rich roots form a staple food in West Africa. The HarvestPlus project at the International Institute of Tropical Agriculture (IITA) is using mass selection in breeding to increase provitamin A (beta-carotene) in cassava roots to address malnutrition, but the process involves screening of thousands of seedlings. Once a root is pulled from the field, it must be analyzed within hours for a decision on selection for the stem for planting, or the stem dries up after few days and won't survive re-planting. With a lab that could only deliver results within days and for hundreds of samples, the goal of HarvestPlus seemed distant.

The solution

Dr. Maroya with International Potato Center met BioAnalyt in 2011 and a solution began to materialize. Following his publication on measuring carotenoids in cassava, Dr. Peter Kulakow and Elizabeth Parkes partnered with BioAnalyt in 2012 to implement iCheck Carotene, a rapid, field-friendly testing method for the determination of beta-carotene in fresh and processed cassava. In tandem with developing iCheck, BioAnalyt is also contributing training, technical advisory, protocol development and reference materials to HarvestPlus program.

The result

iCheck Carotene enables faster and more cost-effective detection of beta-carotene in cassava. By identifying the cassava progenies or clones with the most pro-vitamin A, BioAnalyt is helping HarvestPlus to get as many micronutrients as possible into people's diets – as well as giving local farmers greater access to high-yielding, vitamin A rich varieties.

Cameroon & Spain

The Building Cubes of Life

Keeping one billion vitamin A fortified bouillon cubes affordable

Photo credit: GB Foods

"We knew that vitamin A deficiency was a real problem in West Africa and we wanted to make our products healthier. It was challenging, since we had never made any products with added vitamins before."

Agustin Labrador, *GB Foods Research lead*

The challenge

GB Foods has been producing bouillon cubes for Africa for over 30 years. Knowing that vitamin A deficiency (VAD) is a big problem in West Africa, they begun a new initiative: fortifying the cubes with vitamin A. The product had to meet two requirements: that the there was enough vitamin A and that it was stable. This is no mean feat – bouillon cubes are sold in local markets where the conditions are hot and humid, and are being boiled for an hour before being consumed. How could GB Foods test the cubes for all eventualities?

The solution

Together with GB Foods, BioAnalyt developed an innovative method of testing the fortified bouillon cubes. Taking just 15 minutes to measure vitamin A and assess the quality of the cubes, iCheck Fluoro is both fast and affordable.

The result

iCheck Fluoro enables local, on-the-ground quality control of bouillon cubes. By looking beyond traditional methods, GB Foods was able to bring the fortified cubes to market faster. With reduced cost of testing GB Foods ensures that the product itself is kept affordable – joining the fight against VAD.

Ghana

Golden Drops of Oil

Delivering fortified palm oil to 5 million Ghanaian households every month

"iCheck enables us to effectively and efficiently monitor the amount of Vitamin A in our vegetable cooking oil products, both at the processing stage and samples from trade."

Moses Adade, *Quality Assurance Manager, Wilmar Africa Ltd*

The challenge

When the government in Ghana mandated oil fortification in 2009, food producer Wilmar Ghana was already on it. Aware that 7 out of 10 children under 5 were affected by vitamin A deficiency, Wilmar realised that adding vitamin A to all their edible oils could make a big difference. Challenging but technologically feasible, adding vitamins to their refined palm oil was something they had never done. How would they ensure the process was set up right, that the formulation was stable and reached the population in quantities that mattered? The challenge was heightened by the cost of analytical methods – around $100/sample.

The solution

Moses Adade approached BioAnalyt and the solution began. With his lab team, he implemented iCheck Chroma, a portable, single-wavelength photometer for quantitative measurement of vitamin A in edible oil. Already proven to measure vitamin A in major types of edible oils, he didn't have to spend weeks validating a method internally.

The result

By saving time time and money on testing methods, Wilmar Ghana is able to bring its fortified oil to market faster, as well as ensuring the quality of an oil that's consumed monthly by 5.4 million Ghanaian households.

Mozambique

Nourishing an Industry

The road to fortification is paved with oil, flour and sugar

"The training of laboratory staff is a crucial piece in the food fortification puzzle to make food fortification a reality in Mozambique."

Andreia Faust, *Programme Officer Partnerships (MDG1), WFP*

The challenge

In 2016, the government of Mozambique legislated for the mandatory fortification of edible oil, flour and sugar. While a big step forward for the southern African nation in combating malnutrition, its journey to effective food fortification is far from simple. For the initiative to be effective, there must be industry training, support and monitoring, as well as a quality control process that ensures micronutrients are added to food consistently and at the right levels.

The solution

By sharing its expertise with local and international stakeholders, BioAnalyt is supporting Mozambique on its journey to effective food fortification. In 2014, it consulted at a workshop organized by the World Food Program (WFP) that united local food producers and development partners. At the workshop, BioAnalyt assisted in formulating an implementation strategy for food fortification. Mozambique's government laboratory was then equipped with iCheck test kits, and in 2016, BioAnalyt returned to provide a technical training course to get the laboratory started.

The result

As Andreia Faust says, technical training and an implementation strategy are key pieces of the puzzle in making the fortification of flour, sugar, salt and oil a reality. And in sharing our expertise and leading technical training, BioAnalyt is proud to be a part of solving this puzzle.

Nigeria

Building a Bridge

Developing simple and effective methods of quality control

"The trainings reinforced how important it is for inspectors to understand all aspects of the fortification program; from internal quality control and quality assurance to regulatory audits and sample analysis."

Henry Mark, *Nutrition Officer, UNICEF Nigeria*

The challenge

In 2002, the Nigerian government made the fortification of flour, oil and salt mandatory. By fortifying these staple foods with key micronutrients, their goal is to make sure that every Nigerian receives the vitamins and minerals they need, helping to reduce the incidence of spina bifida in unborn children, anaemia among women of reproductive age and to enhance cognitive development in children. In the beginning, the program was fraught with challenges: industry and government were not communicating. Food producers said that they were fortifying, but the government had no way of controlling it. Without evidence there was no trust.

The solution

There needed to be a bridge built between government and industry, and this bridge was effective quality control. The quality control mechanism needed to be fit for purpose. It needed to be more like a bicycle than a spaceship: quick to learn and field-friendly. As well as providing hands-on training for its iCheck micronutrient test kits, BioAnalyt held full system workshops on all aspects of quality control, from auditing to inspection; sampling to impact studies.

The result

The National Agency for Food and Drug Administration and Control (NAFDAC) and Standard Organisation of Nigeria (SON) hosted over 5 training sessions, of which BioAnalyt is a major contributor. The workshops unite government, private sector, development partners, civil society and academia, ensuring that they work in unison to achieve the goal of universal fortification in Nigeria.

Ghana, Ivory Coast, Nigeria, Rajasthan, Uganda, Tanzania, Senegal, South Africa

The FACT of the Matter

Increasing coverage of large scale food fortification programs

"Partnering with BioAnalyt made sense because we needed a rapid and reliable way to test fortified foods to assess coverage and improve the delivery of national fortification programs."

Greg Garrett, *Large Scale Food Fortification Director, GAIN*

The challenge

The vision of Global Alliance for Improved Nutrition (GAIN) is a world without malnutrition. To achieve this vision, they advocate the fortification of staple foods – recognized to be a cost–effective public health intervention that can reach large segments of the population. The impact of food fortification program lies in its coverage, or the proportion of people at risk that that the program reaches. Assessing a program's coverage – especially of those who need it most – is a recurring challenge for organizations, who are often beleaguered by small sample sizes, geographical limitations and high laboratory costs.

The solution

Fortification Assessment Coverage Tool (FACT), implemented by GAIN, is painting a clearer picture of the efficacy of fortification programs. Unlike traditional coverage assessments, FACT samples communities from all over a region – not only those in urban towns or cities – and focuses on 'asking the right questions' to identify barriers to coverage. To fully map the coverage, lots of samples need to be tested. BioAnalyt efficiently and accurately analyzed the samples with its iChecks and partner labs.

The result

By partnering with BioAnalyt, FACT's coverage assessment could be two crucial things: affordable and scalable. Coverage assessment surveys were performed in ten countries. India, Ghana, Ivory Coast, Nigeria, South Africa, Senegal, Tanzania, Bangladesh, Uganda, and Mozambique. By identifying coverage barriers during program delivery – and addressing them to improve coverage as the program rolls out – GAIN is bringing effective food fortification to more and more people around the world.

Vietnam

The Milk Run

Developing a field-friendly method for testing breast milk samples

Photo credit: Henry Dirren

"The iCheck Fluoro is very field-friendly, allowing an immediate vitamin A determination in fresh milk."

Dr. Henri Dirren, *Children's Hospital Oakland Research Institute*

The challenge

Low birth weight and preterm birth are significant public health concerns for rural farming women in Vietnam, who are often affected by undernutrition and associated infection. By improving consumption of micronutrient-rich meals before and during pregnancy, Dr. Henri Dirren of the Children's Hospital of Oakland Research Institute (CHORI) is aiming to improve maternal and infant health. However, his study encountered a challenge: he needed a method to quickly and easily test breast milk samples to assess the effect of the meals.

The solution

HPLC is the go to method for testing breast milk, but is time consuming and requires a lab. Instead, Dr. Dirren used BioAnalyt's iCheck Fluoro to measure vitamin A concentration in his participants' breast milk. He was able to train his team to use iCheck Fluoro, and testing could be done on site in participants' homes.

The result

By being field-friendly and adaptable, iCheck Fluoro enabled Dr. Dirren to test his samples without long and laborious lab work. His study could also be more reactive: when enrolment increased and the phlebotomists could no longer manage the milk sampling, he trained other members of his team to assist.

Indonesia

The Power of Curiosity

Engaging 4,000 households to encourage behavior change

Photo credit: HKI Indonesia

"Based on the observations from the field, we received almost 100% participation at endline because our beneficiaries as well as family members were eager to know the results."

Dian Hadihardjono, *Program Coordinator, Helen Keller International*

The challenge

In impoverished communities, rice and maize are often the predominant sources of nutrition. With the absence of protein and micronutrient-rich vegetables from their diets, people can suffer from wasting, stunting and malnourishment. Homestead Food Production (HFP) program by HKI is helping to diversify diets through training and education, but it ran into challenges in encouraging the participants of the study to adopt the recommended diets.

The solution

In the HFP program's baseline study, blood samples had to be quickly frozen and analyzed at base camp – miles away from the participants' villages – meaning that participants couldn't find out the results of their blood tests. To encourage participation in the endline study, BioAnalyt's iCheck Fluoro & iCheck Iodine were used to analyze blood, breast milk and salt samples on the spot, generating individual health cards with their personal data for the villagers.

The result

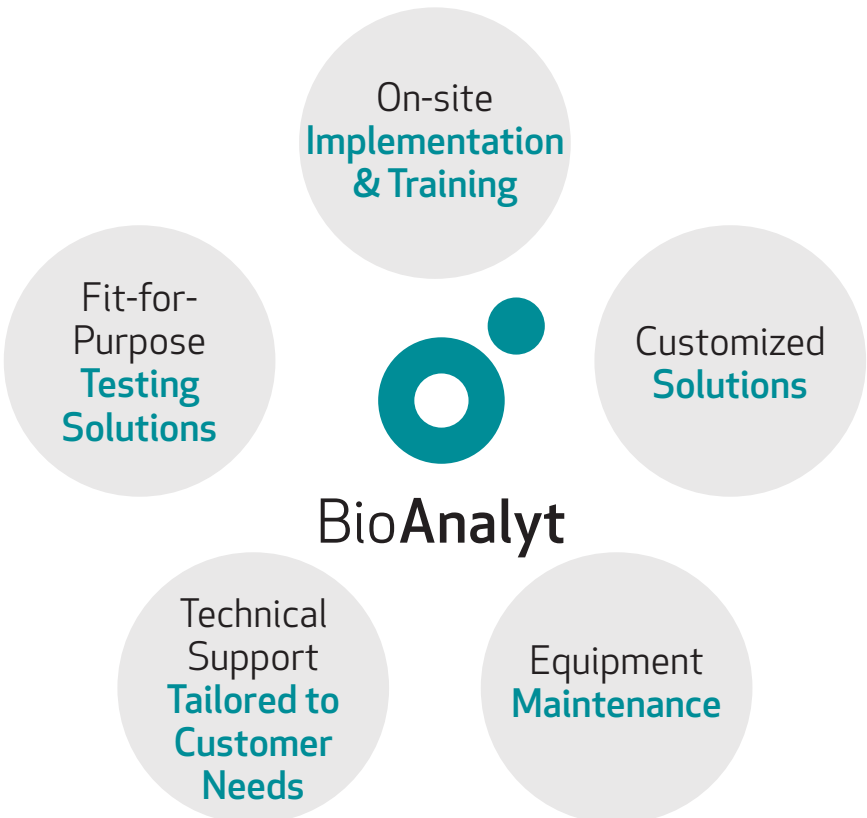
Participation increased in the endline study as people were curious about the results of their tests. Moreover, BioAnalyt's iCheck systems allowed participants to receive immediate feedback and counseling on their health and diets, encouraging sustainability of the four-year initiative.

Make **evidence-based decisions** with custom solutions

We support each and every stakeholder to ensure the success of nutrition programs. Including:

- **Food producers** that test the quality of vitamin premixes and the finished product on site
- **Government food inspectors** that monitor the compliance of food producers and imports
- **Scientists in research institutes and labs**, who require scalable and fast results in nutrition research
- **Nonprofit organizations and civil society**, which monitor the progress and impact of nutrition programs

Our current solutions enable measurement of these critical-to-health micronutrients: iodine, iron, vitamin A, and zinc.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Rheinstraße 17 • 14513 Teltow, Germany • T +49 (0)33 283 51 5 000
contact@bioanalyt.com • www.bioanalyt.com