IS IT TIME TO UPDATE MY ANALYZER?

One of the important decisions that must be made from time to time in a laboratory is to renew existing systems to reduce operating costs due to increasingly frequent corrective maintenance or simply to take advantage of technological improvements that have appeared in recent years. With investment in instrumental systems possibly the most important category, having an element to assess the possible future savings involved in making the decision between renovating or maintaining.

- ✓ **Volume of work:** It is possible that from the moment the existing equipment was purchased the laboratory load has shifted, possibly towards a greater volume of work. The ability to process the workload within the operational routine of the laboratory becomes a decisive factor. Instruments with a higher processing capacity (average in tests per hour) or with a higher walk-away capacity (measured in the number of sample or reagent positions available) make it possible to optimize the time available to technical personnel, increasing their productivity. An instrument with greater capacity to process increasing workloads would reduce the associated personnel costs, freeing technicians for other more intensive tasks in manual intervention without the need to hire personnel.

- ✓ **Consumption optimization:** One of the most important technical improvements introduced in the latest generation analyzers refers to the lower consumption of reagents in each determination. This improvement is achieved by an improvement in the design of such important elements as the optical system, the sample needle, the fluidic system or the reaction cuvette, which can achieve improvements in reaction consumption of up to more than 50%. Some common instruments in testing laboratories were designed more than 15 years ago, and use up to 25% additional reagent to clean the needle to avoid carryover contamination; others, due to its optical design, do not allow working with volumes lower than 200 uL (when 150ul is usual in current systems); or, due to the imprecision associated with its fluid system, it cannot aspirate a sample volume lower than 3uL, forcing a higher reagent consumption. If we consider all these factors, we can find consumptions that reach, on average, up to 35% more than in a last generation system, so the change could mean that same percentage of savings in reagents.

- ✓ **Maintenance cost:** All laboratory instruments need preventive maintenance and periodic calibrations to ensure their correct working order. These maintenances can become more frequent over time and include particularly expensive components subject to wear. From the simple change of a lamp to ensure sufficient light intensity, through the replacement of filters or replacement of cuvettes are common operations that are carried out every 12-24 months. Other less frequent operations include the replacement of peristaltic pump pistons or tubes due to wear, electronic board repairs that can be especially complex if the model in question is old or has been replaced by other more updated models by the original manufacturer. Some of them may be unnecessary if the analyzer has more efficient alternative systems (diffraction matrix instead of filters, ceramic pistons, sealed optical system, low-cost semi-permanent cuvettes).

- ✓ **New features:** The initial automatic analyzers were essentially robotic systems whose main objective was to simplify the handling of reagents through a repetitive sequence; In doing so, it was possible to minimize random errors due to manipulation, improving the precision of the result. This advance was a very important step in improving the productivity of a laboratory, but it is currently insufficient if we want to get more out of our results. Thus, as the laboratory's needs increased, especially in the metrological field, the analyzers had to introduce management support tools that allowed not only to control important aspects of the pre-analytical phase (identification of samples, more complex profiles, order of analyzes, pre-dilutions, etc.) and post-analytics (historical results and calibrations, internal quality control, inventory management, repetitions, general statistics, communication with external management systems, etc.). These tools are essential in case of using techniques subject to accreditation, or of wanting to perform analysis of groups of samples that meet certain characteristics in continuous improvement processes within the industry. Another clear field of improvement is in the management of the system itself, which takes advantage of the technological advances of computing itself: current computers allow the introduction of more powerful management programs that, without losing the comfort of use, simplify the preparation of work lists complex. Although it is difficult to assess the direct economic impact that these benefits may have, it is clear that they allow an improvement in productivity.
- ✓ **New techniques:** Although automated analyzers are capable of performing many different tests, it is necessary that the reagents are suitably adapted to the specific characteristics of the instrument. As there is a technical evolution in the design of the instruments, the reagents must also be optimized to achieve the maximum performance in the instrument, both in terms of consumption and in terms of metrological performance. Sometimes this evolution is simultaneous and having a state-of-the-art analyzer is a guarantee of reagents specifically optimized for use with maximum performance, including options for use that were previously not available due to the system's own limitations. By having the possibility of introducing these techniques in the laboratory itself, the costs of outsourcing these tests are reduced.

Sinatech offers the most advanced Dionysos system for agri-food analysis on the market, prepared to work under the most demanding conditions and with minimal reagent consumption. Benefit from all the technical advances aimed at achieving maximum precision and accuracy.