THE CENTRAL ROLE OF INFORMATION MANAGEMENT SOFTWARE IN A NON-GMO VERIFICATION PROGRAM

A White Paper

Abstract

The role and benefits offered by an information management software system to efficiently and cost-effectively manage the non-GMO verification process

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I. INTRODUCTION

The Non-GMO Project (NGP) was launched in 2005, with the first products becoming verified in 2008. Today, the NGP has verified more than 40,000 products for over 2,500 companies, including evaluating 25,000 unique ingredients from 17,000 suppliers based in 102 countries. Non-GMO Project Verified is the fastest growing label in the natural products industry, with annual sales topping $14 billion, projected to grow 15% per year.

Non-GMO Project Verified certification is one of the toughest and most rigorous food quality programs in the world in terms of its requirements. The NGP verification process requires an in-depth document review and may also include testing and facility inspection. Products and ingredients are evaluated and assessed (including food enzymes and processing aids) including every constituent of the animal feed used in the production of meat, poultry, and dairy products. Ingredient reviews are performed by Non-GMO Project-approved technical administrators, which require that manufacturers present detailed, complete, and current records of formulations, production processes, packaging labels, and supplier data.

For some certification enrollees with multiple brands, or perhaps dozens or hundreds of products, undertaking the required administrative due diligence and in-depth review can present challenges. For each product enrolled, companies must track changes to criteria throughout the year and submit updated information for Non-GMO Project Verification annual renewal. We have found that for many companies this information is not always readily available and may require effort to gather, creating a potential hurdle for organizations wishing to meet the information requirements for NGP verification.

Supply chain compliance management software such as FoodChain ID's proprietary SupplyTrak online system automates many aspects of the NGP verification process, allowing enrollees, consultants, technical advisors, co-packers, and ingredient suppliers — indeed, anyone with access to a secure online account—to navigate, 24/7, the complexities of information management required of brand owners, facilities, suppliers, and manufacturers for products, ingredients, and sub-ingredients.

In this white paper, we explore the central role of an information management system in managing, tracking, and sharing the data required in the verification process, and how such a system enables participants to efficiently and cost-effectively implement a non-GMO verification program. In addition, we present the advantages available when organizing data into such a system.

II. HISTORY

Over several months in 2003 and 2004, a number of food industry retailers, distributors, and manufacturers joined together in a dialog addressing a growing concern around the issue of accidental GMO contamination of organic products, as well as to respond to the need to identify for consumers which natural and conventional products did or did not contain genetically engineered ingredients. At the time, the food products on retailer's shelves displayed more than a thousand different non-GMO claims — for which no clear definition of "non-GMO" existed. It was clear that a defined standard practice that could back non-GMO claims was needed, as was the establishment of an independent, trusted third-party which could verify compliance to that standard.

To create a non-GMO verification process and a packaging seal for use by retailers, the group founded the Non-GMO Project, a 501c(3) nonprofit organization (located in Bellingham, Washington). The NGP detailed its process of creating a standard and associated practices, engaging the technical expertise of FoodChain ID, a subsidiary of Global ID Group, to establish the design and administration of a Product Verification Program (PVP). Historically, Global ID Group and its subsidiaries Genetic ID, Cert ID, and FoodChain ID had been working in GMO testing and non-GMO certification for nearly 20 years, assisting several members of the newly formed NGP Board of Directors in their own efforts to develop internal non-GMO verification programs.

The first step for the Non-GMO Project was to create a consensus-based *Standard* defining the precise parameters around which a verification program could be based. Drawing from Cert ID's existing framework in creating a Non-GMO Certification Standard (for commodity crops), introduced in 2000 and highly regarded and globally accepted, the NGP commenced to produce a draft *Standard* and solicit feedback from every segment of the food industry over the next two years. Following that process, its newly minted *Non-GMO Project Standard* was published.

The NGP's overarching goal in developing the *Standard* was the creation of a rigorous, achievable, meaningful definition of "non-GMO" to address the myriad of issues surrounding the topic, such as whether products derived from animals fed GMO feed were considered non-GMO (allowed in the European Union but ultimately disallowed in the *NGP Standard*), and whether products using enzymes, processing aids, and binders, etc., which are derived from genetic engineering would be allowed (again, yes in the EU, no for the NGP). Other issues included defining appropriate, allowable GMO thresholds for food, seed, and feed; requirements for proof of

compliance with the *Standard*; treatment of micro ingredients, and more. After the conclusion of the initial comment period, the first version of the approximately 25-page *NGP Standard* was released and the first product verifications commenced.

III. DEVELOPMENT OF SUPPLYTRAK

From the beginning of its engagement with the Non-GMO Project as its first technical administrator, FoodChain ID recognized that an enterprise-class database software system would be essential to developing an effective administrative platform for the NGP's Product Verification Program. It was anticipated that users would number in the thousands and that the volume of data entered, stored, modified, and reported on would be significant. The system would require robust security, high performance, and a user friendly interface. Also recognized was the need for efficient, cost-effective, and automated processes that could assess the comprehensive datasets submitted for products undergoing verification. Such a system would require three major components:

a. Supply Chain Mapping

Each product undergoing verification would have to be represented, along with its ingredients, including name, supplier(s), dry weight relative to the whole product, facility (or facilities) where the ingredient was manufactured, relevant contact information, and data on sub-ingredients contained within the ingredient. A similar dataset would be required for each sub-ingredient. The system would need to be accessible online by product manufacturers and ingredient suppliers globally, who might or might not be fluent in English or be computer proficient.

The process of organizing the required data is essentially one of creating a data map of the supply chain. While some companies already maintain this information in a centralized and integrated database, many others (likely, most) employ unwieldy combinations of multiple databases, spreadsheets, and paper-based systems spread across the organization, which may or may not contain the complete dataset required by the PVP. Further, in many companies, much of the data created during a product's initial development stage, or later (as formulations and suppliers change over time), is not updated or kept current. Such companies may find themselves uncomfortably tested by the PVP's requirement of an annual renewal of each product's non-GMO verification, which requires data confirmed as up-to-date. Furthermore, any significant change in a product's formulation, or new product additions, or changes with regard to suppliers, co-packers, facilities, etc., during the year prior to renewal must also be recorded.

Any changes in the *Standard's* requirements must be met at the time of annual renewal. To aid this process, SupplyTrak automatically alerts users of upcoming renewal deadlines and updates that are applicable to the user's process. It tells users where and how to store the newly required documents, whether or not the previous year's data remains applicable, how to update it and store it if it is not, or, if it is, how to confirm and store it in the current year's records.

b. Assessment Criteria

While supply chain mapping tends to be similar among companies and products, mapping a *particular* supply chain against compliance with the *NGP Standard* requires unique functions and features. A generalized supply chain mapping system would likely not include the functionality of GMO-risk assessment. For example, SupplyTrak provides more than 200 preprogrammed functions for *NGP Standard* compliance. Examples include the identification of the GMO-risk level of ingredients; calculation of dry weight percentage of GMO-risk ingredients; determination of whether certain minor or micro risk ingredients can be approved due to waivers temporarily in place in the *NGP Standard*.

c. Assessment Management

The process of documenting ingredients, suppliers, and manufacturers commences after a company's designated user adds a new product into SupplyTrak, as does the process of assessing each ingredient against the *NGP Standard*. The first step is scanning and uploading an image of the product's packaging label, which is checked against the list of submitted ingredients. The next step addresses the fundamental question of whether or not the ingredient is "high GMO-risk" as defined by if its source has either itself been genetically modified (e.g., corn, soy, cotton, canola, etc.) or whether the ingredient was derived from animals that may have ingested feed containing GMO material. It may also include where and how that ingredient was manufactured. For example, an ingredient processed in a facility that also manufactures GMO ingredients may have been subject to contamination during processing; in such cases, inspection of the manufacturing facility may be required. For low GMO-risk ingredients bearing no contamination risk, little or no further verification work may be required.

Next, the remaining high GMO-risk ingredients undergo a process of assessment to verify their non-GMO status in accordance with the definitions set forth in the *NGP Standard*. This begins an iterative process in which each supplier is informed regarding which compliance documents are required for their ingredient(s). All such documentation is forwarded to FoodChain ID for evaluation. Following that, the supplier is informed if the documentation has met the *Standard's* requirements. If it has not, further documentation will be required, which could include laboratory testing results, proof of non-GMO certification, evidence that a given ingredient derives from plants grown in GMO-free regions, or similar. In addition, facility or plant inspections may be required of the suppliers of certain ingredients, with the results of those audits being uploaded into SupplyTrak.

If a supplier's required documentation is incomplete or inadequate, the supplier must correct the deficiency and resubmit/upload the information or documents into SupplyTrak. (Note: suppliers may be allowed direct access to SupplyTrak by the brand owner.) All such communications are handled in SupplyTrak's proprietary internal workflow journaling system which optimizes communications between technical evaluator and customer/supplier. Since SupplyTrak is a cloud-based platform, users may access it 24/7 from anywhere in the world.

Since the NGP verification process spans a complex range of criteria and may include data from thousands of products, multiple brands, co-packers, co-ops, multi-national companies, supplement manufacturers, and others, its database system must accommodate multiple information types and use scenarios. In response to these needs, SupplyTrak offers robust management capabilities, and efficiency and simplicity in managing and reporting on the verification process. This is especially important in the case of brand owners with inventories of hundreds of products intended for non-GMO verification. A challenge managed by SupplyTrak may include, for example, a supplier that is unresponsive to information requests or whose incomplete or inadequate documentation delays the assessment of a product.

SupplyTrak gives a parent entity clear visibility into the verification process for all of its enrolled products and ingredients, ensuring that suppliers can move forward at a rapid pace. Issues of timing will especially affect companies seeking product verification for the first time, and may influence marketing and operational decisions linked to a product's NGP verification, such as press announcements, advertising campaigns, and label and packaging printing schedules.

IV. BENEFITS OF AN AUTOMATED VERIFICATION PROGRAM

For companies who have even a modest number of products enrolled in Non-GMO Project verification, a software-based automated process offers time- and cost-saving benefits for all parties involved. These include:

a. A Single, Centralized Repository for All Information

Given that relevant data and information on products, ingredients, and suppliers is often spread throughout an organization and may appear in different forms (e.g., paper, spreadsheets, databases, etc.), and that compliance documents such as test results and certifications may also be similarly dispersed in the supplier community, SupplyTrak's single, centralized database is essential for providing participants with a high level of control and visibility into the verification process, expediting the time to verification as well as lowering verification costs. For smaller companies, this is helpful; for larger ones, it is indispensable.

b. A More Efficient Way to Communicate

SupplyTrak standardizes and streamlines communications between all stakeholders in the supply chain, including brand owners, co-packers, ingredient suppliers, independent consultants, technical administrators (TA), and the TA's customer service agents. All communications are seamless within SupplyTrak's workflow-journaling system, where messages pass in both directions, from FoodChain ID evaluators assessing verification information to NGP participants, and back. When voice communication occurs, conversations are noted within SupplyTrak, creating an ongoing and complete record of exchanges documenting the verification process. Such documentation is especially important when disagreements arise; for example, in the case of a given supplier who claims to have provided all required information when the journal records show otherwise. Or, where a supplier had been informed that their documentation was inadequate, yet dropped the ball in completing the process. The product owner then has an opportunity to track and communicate needs directly with the supplier to acquire the data.

c. The 'Network Effect'

As more participants enroll in Non-GMO Project verification and use SupplyTrak, an accruing benefit occurs in the growing ecosystem of users. The user community may include QA managers, their teams, marketing and operations staff who may access the system, outside consultants engaged by participating companies to assist in the

verification process, and suppliers and their communities of staff. To meet the needs of all these constituencies, SupplyTrak was developed to be as encompassing, sophisticated, and organized as the *NGP Standard* it serves.

While SupplyTrak was designed for ease of use, a learning curve does exist for new participants. In September 2016, its ninth year of operations, SupplyTrak is used by more than 2,500 brand owners and 12,000 suppliers involved in the Non-GMO Project verification of over 40,000 products and 20,000 unique ingredients. The SupplyTrak user community is fluent in the software and understands its data management processes and how to advance efficiently through to verification. As food industry personnel migrate from one company within the industry's "small world," trained users carry their knowledge of SupplyTrak and the PVP along with them to new companies and situations.

An example of a benefit of the "network effect" is that when a particular ingredient is verified for one product, the brand owner does not need to have it verified again for the next product (as long as variances have been correctly considered). Thus, as more ingredients gain NGP verified status, it becomes increasingly easy and less costly for additional products to achieve verification. Further, as the supplier community gains greater mastery in using SupplyTrak, and greater expertise in the requirements of the *NGP Standard*, the entire supply chain benefits by becoming adept in making more compliant ingredients available to the manufacturing and processing industries. At present, SupplyTrak data shows that NGP Verified products use ingredients from over 100 countries, highlighting the global nature of a phenomenon that benefits all non-GMO producers and suppliers worldwide.

The *NGP Standard* emphasizes best practices for avoiding GMO contamination, including proper cleaning of processing equipment, storage and transportation; segregation; and identity preservation. The success of the Non-GMO Project has elevated the performance of the global supplier community and increased access to compliant ingredients around the world.

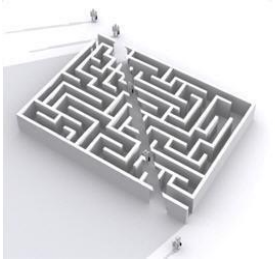
d. Advantages Over Paper-Based Systems

Working towards compliance with the *NGP Standard* without the aid of an automated system takes significantly longer for companies, suppliers, and the NGP technical administrator. The result is higher costs for all involved. The NGP technical administrators who still rely on paper-based systems pass on the resulting inefficiencies to customers in higher expense. And, costs increase exponentially as the number of products and ingredients undergoing verification grow. For instance, a company with 100 Non-GMO Project Verified products, which use, say, 1,000 Non-GMO Project Verified ingredients that undergoes a change of suppliers or a

reformulation of ingredients will likely have to manually pour through all of its supply chain information once again to identify which products use which suppliers and ingredients. Such a process, requiring a few keystrokes in SupplyTrak, can take hours or days when performed manually.

Similarly, the verification process becomes arduous for a TA's evaluation team when a low GMO-risk ingredient suddenly moves into the high-risk category, as in the case of potatoes. Until 2015, genetically engineered potatoes were not commercially available. However, it is anticipated that a GMO potato may soon be sold commercially, which will likely shift potatoes from a low-risk to a high-risk category that may require testing and other non-GMO compliance measures within the NGP's Product Verification Program. As there are many products containing potato and its derivatives, it would then become necessary for all product owners to reexamine their ingredient lists and identify all such ingredients. For SupplyTrak users, this is a simple and quick process—but not the case for the users of paper-based systems; for them, it will be arduous and costly in time and administration. SupplyTrak also offers time savings in its user support, in the form of Help functionality in drop-down menus, edited field values, automated reminders, updates, instant responses to inquiries, and telephone and email support.

e. Simplifying the Process of Making and Tracking Changes



Products and their ingredients change frequently. Products are added, discontinued, and reformulated. Packaging designs change, new sizes appear, and ingredient suppliers change. Ingredient suppliers may change the facility at which their ingredients are manufactured. To accommodate such change, SupplyTrak employs a single data repository that all users share and reference—users which may include product owner, ingredient supplier staff, and technical administrator staff. All these individuals may be spread across different offices and geographies worldwide. In contrast to the single database, users of a paper-based system (e.g., an ingredient supplier) must update their data at one location and then communicate it to the rest of the players manually, which can lead to time delay, human error, and the possibility that information may not be sent or be lost of miscommunicated. For example, the technical administrator FoodChain ID once experienced a supplier changing from a sugar-based non-GMO sweetener to a high-fructose corn syrup sweetener—which is high GMO-risk and thus subject to the possible testing requirement—without informing the product owner. This would have led to the product losing its NGP verified status had it not been flagged in SupplyTrak.

f. Learning the Requirements of Verification

SupplyTrak provides robust supply chain mapping and verification workflow tracking features to accommodate any verification program, using a user-friendly graphic user interface (GUI) and built-in NGP-specific features, making it simple for users who may not be experienced in the complexities of the NGP verification process.

As SupplyTrak embodies the *Non-GMO Project Standard's* philosophy as well as its functional requirements, the process of learning how to use the system is simultaneously a way to learn *NGP Standard* compliance. SupplyTrak's Help functionality includes hundreds of explanations of fields and functions. Conveniently, the process of skill-building in SupplyTrak is also a training ground for gaining expertise in the NGP's Product Verification Program. And, since the *Standard* is updated or amended and exceptions added annually and/or its variances changed or discontinued each year, SupplyTrak automatically incorporate these changes, so that products enrolled in NGP verification can be brought into compliance, even as new products are checked against new requirements. SupplyTrak analyzes product data in response to *NGP Standard* updates and generates context-specific tasks needed to achieve compliance.

For facilities or plants that require onsite inspection, SupplyTrak functionality is time- and cost-saving. The uploaded data necessary for audits are automatically delineated for the client and visible to the facility inspector. Results of the audit are stored in SupplyTrak, accessible by both FoodChain ID evaluators and client user. All non-compliances, corrective action requirements, follow-up dates, and completions are accessible to these users.

g. A Standardized Approach Across the Company

Users of SupplyTrak undergo a standardized training process which gives their work an internal consistency, while newer staff shorten their learning curve as they ramp up to speed. This is particularly valuable for larger companies with more staff and multiple offices. Because SupplyTrak workflow tracking provides locations for all journals and follow-up communications, the system makes it easy for multiple users to pick up the process wherever they or other users left off.

h. Easier to Work with Consultants

Some organizations engage outside consultants for help in achieving NGP verification. Given the demands typically weighing on QA departments, this can speed up the

verification process. However, for organizations lacking a centralized and automated database system, the time and cost of consultants may become prohibitive and add time in the workflow. To lower such expense, a centralized online system such as SupplyTrak allows all participants, including consultants, to efficiently work with the same data. Conversely, using a paper-based system, participants must manually send data to the assessing entity and then resend that same data to the consulting entity, which will then review, revise, and massage it, as required, after which it will need to manually communicate those changes to both the technical administrator and its client. This can result in time delays, errors, and misalignment, since the data resides in different locations.

If a company requests that a consultant assist on products that have already been enrolled in a manual system, then that company may well have to supply all of the same information to the consultant in the form the consultant requires, as the consultant will have no way to access the manual information that had been supplied to the technical administrator. Such duplication of effort introduces inefficiency and additional cost into the process, making it less optimal to all parties compared to having immediate access to a centralized data source.

i. Efficient Billing and Invoicing

Technical administrators generally offer different pricing models for their verification services. Costs typically include administrative fees for enrollment, product/ingredient fees for verification, fees for plant inspections, and annual renewal fees. In addition are fees that go to the NGP itself as well as possible additional costs for consulting services. As companies add and remove products throughout the year, and as products come up for annual renewal at different times, the process of accurately calculating fees due in a given month can be complex. Likewise, for a company reviewing an invoice from its TA, attempting to comprehend whether or not the invoice is accurate can be equally challenging. In an automated system such as SupplyTrak, which provides detailed information on how a bill is calculated (based on user data), billing and invoicing becomes straightforward and efficient. In a paper-based system, by contrast, invoicing can be complex and time-consuming; it may be difficult for the service provider to provide all the details that may be necessary for a client to validate the invoice. Furthermore, if a dispute arises over an invoice, the process of researching and recalculating costs can be burdensome for the service provider, unlike in an automated system. Inevitably this leads to higher costs and, ultimately, higher charges for services.

j. Security

The Non-GMO Project is an independent, non-profit organization established by the food industry to give consumers meaningful information which they can use to make informed choices about non-GMO foods and products. The NGP's Product Verification Program requires the disclosure of highly sensitive information from brand owners such as supplier names and proprietary product formulations. The NGP's process accommodates the protection of this information. Each enrollee and their suppliers' participation in Non-GMO Project verification is confidential and protected by non-disclosure agreement. The SupplyTrak system offers multiple levels of security including data encryption, access permissions, transaction trails, and other features. Data is backed-up in multiple generations in a database that resides on centralized servers located in secured data centers. Alternatively, paper-based systems are inherently insecure and pose greater risk of loss or theft.

k. Leveraging the Investment

Once a Non-GMO Project verification enrollee has committed the investment of time to the process and resources, and has paid for mapping their products' supply chains for the purposes of the Product Verification Program, that valuable investment can be leveraged to meet other company needs. Many brand owners are being asked to provide more and more information about the practices of their suppliers, wherever they are located and regardless of where they are in the supply chain. SupplyTrak can be leveraged for a number of needs. It was designed as a general purpose supply chain compliance platform to track and measure compliance against any number of criteria, from single issues such as GMO, gluten-free, and kosher to complex, multi-dimensional issues such as organic, social responsibility, and sustainability. These needs may be in response to internal standards that a company wants to enforce across its supply chain or in response to a need to conform to certain international standards. In all cases, measurement occurs against the same supply chain, so that once that supply chain has been mapped, the various evaluation criteria can then be applied to the appropriate members in the chain. For example, some criteria (such as required for a GFSI food safety certification) would only be applied to food manufacturing facilities in the chain. For a different set of criteria, a brand might consider only suppliers outside the U.S. or in some other specific region. The critical point is that a supply chain map can serve a myriad of purposes; once it has been created, the work invested can be used to perform other types of measurement and analysis if stored and managed in a database system such as SupplyTrak.

V. GOING FORWARD: SUPPLYTRAK EXPANSION

FoodChain ID has announced that work is underway that will allow NGP enrollees to use SupplyTrak to track the status of their products and ingredients with regard to organic, kosher, gluten-free, and GFSI certifications. Thus, companies will be able to track the certification body that granted the certification, the date of certification, date of renewal, and other key information related to a given certification. They will also be able to print reports and receive notifications of upcoming renewals to ensure that their products and ingredients remain in compliance with requirements. We look forward to providing these additional capabilities in SupplyTrak in the coming months.

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