



2017

# Annual Report



معهد البحوث الصناعية  
INDUSTRIAL RESEARCH INSTITUTE  
INSTITUT DE RECHERCHE INDUSTRIELLE





*IRI extension (5500m<sup>2</sup>)*

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## IRI: Its Purpose & Function

The Industrial Research Institute is a Lebanese institution for studies, industrial research, and scientific testing and analysis. IRI is a non-profit, non-commercial, public utility organization having an independent legal personality with the right to own, purchase, sell, insure, accept donations, take loans, and engage in litigation and similar activities. IRI was founded in 1953 and was linked to the Ministry of Industry pursuant to Article 3 of Law n° 642 of June 2, 1997. IRI is governed by private law, and its bylaws and internal and financial regulations.

IRI enjoys financial and administrative independence and is subject to post-auditing by the Court of Accounts in what concerns the contributions of the government to IRI.

IRI's headquarters are located in Hadath, and it is entitled to establish branches in all parts of the Lebanese Republic and abroad.

IRI is an independent national research center, and combines:

- Knowledge, expertise, and specialization
- Scientific material and equipment
- Data and technical documents.

IRI offers specialist scientifically reliable services to the national economy as well as existing industry and those which can be established with the aim of industrial development. The services include:

- Consultations
- Studies and research
- Testing, metrology, and analysis.

IRI, through its activities and operations, seeks to achieve the following goals:

- Conducting research and studies to enable the establishment of new industries
- Conducting research and studies on various materials and items to learn their properties and determine their uses and applications
- Offering specialist consultations on technological, administrative, and economic matters related to existing industry with the aim of industrial development and encouraging the creation of new industries
- Offering internationally accredited services in testing, analysis, and metrology related to materials and items, and issuing certificates of quality and conformity certificates
- Collaborating with national and international official bodies, and economic institutions and trade unions with the goal of fostering economic development.

IRI brings together a reliable body of experts, specialists, and engineers in many fields to carry out its activities, supported by another body of administrators, accountants, and clerks who undertake administrative tasks and other internal services.

## Our Ethical Standards

In carrying out its functions, the Institute adheres to ethical and professional standards whereby it safeguards the clients' best interests. Furthermore, IRI regards as the client's property any information, processes, patent or techniques developed during work with the client and safeguards such matters in complete secrecy.

## On the verge of the third decade...

*Director General of the Industrial Research Institute*  
**Dr. Bassam Frenn**



Forward we go, no looking back. We step ahead guided by our unchangeable goal we set twenty years ago. Fulfilling a crystal clear vision, raising the Industrial Research Institute from the steps of the ugly reality to the top of a beautiful dream that simulates the success of science.

Slowly but surely, we move steadfastly with a lot of self-confidence and zeal to protect the reputation of the institute and the homeland.

Year after year, the features of the Dream – Vision becomes more visible, it does not stop regardless of its many accomplishments. It does not stumble irrespective of many hindrances caused by the general atmosphere that governs the country and the region.

The Industrial Research Institute continued its activities during 2017 relating to conducting conferences, seminars, and workshops under the patronage of the concerned ministers as well as sharing in similar activities on both regional and international levels. The Industrial Research Institute was represented either by me personally or by other Industrial Research Institute key personnel.

As for our key roll exhibited by laboratory testing and examination, conformity assessment, technical consultations, custom file studies and conformity testing versus technical standard requirements. Not forgetting the inputs of the technical centers working under the Industrial Research Institute umbrella like, The European-Lebanese Center for Industrial Modernisation (ELCIM), The Lebanese Cleaner Production Center (LCPC), The Center for Innovation and Technology (CIT), The Lebanese Welding Center, ... and what they contribute of assistance and training to the Lebanese industry, which is interpreted in upgrading and substantial economical savings.

With the project of the renewal of liquid petroleum gas cylinders, intended for house use, which incurred a substantial increase in the workload. The total tests and examinations in all laboratories have increased up to one million four hundred thousand tests and inspection operation.

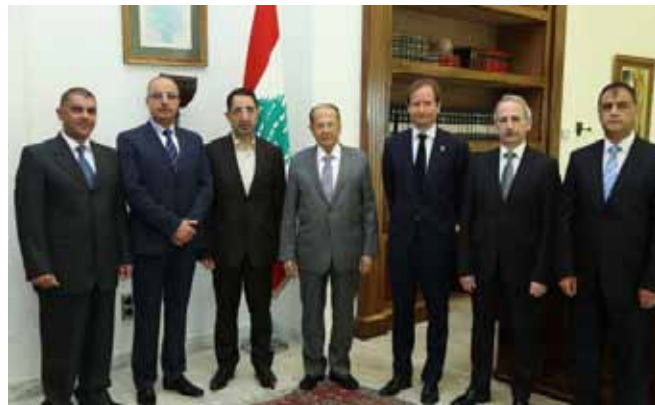
All these developments necessitated The Industrial Research Institute's expansion, a new addition to the original premises. A new building has been erected which will encompass more and more of the scientific and technical equipment and apparatus, new human resources recruitment, in the prospect of strengthening the cooperation of both the public and the private sectors in Lebanon.

Here we are, stepping into the third decade with more confidence, ambitious and trust in building the future...

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**IRI General Activities**



**During 2017, the Industrial Research Institute participated in a wide range of official activities, which extended beyond Lebanon to include external activities.**

**While this section is dedicated to the activities of the Minister of Industry Dr. Hussein Hajj Hassan, both the minister and IRI's Director General, Dr. Bassam Frenn, took part together in many common activities.**

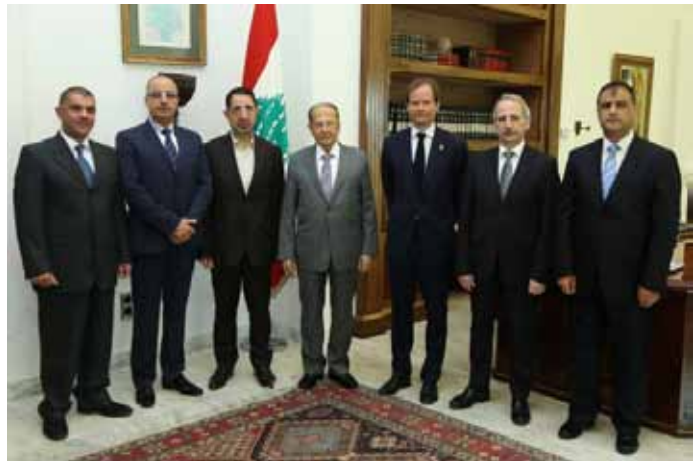
**Notably, a visit to His Excellency, the President of the Republic General Michel Aoun, a visit by the State Minister for Combating Corruption Nicolas Tueni to IRI's premises, and the graduation of LU engineering students after completing a welding session,...**

## HE President Aoun is briefed by the Minister of Industry and an accompanying delegation on the development of three advanced industrial cities and on IRI's planned modern and integrated building

**His Excellency, the President of the Republic General Michel Aoun received at the presidential palace the Minister of Industry Dr. Hussein Hajj Hassan, along with a delegation including the Director General of the Ministry of Industry Dany Gedeon, IRI's Director General Dr. Bassam Frenn, UNIDO's Regional Representative for Lebanon Cristiano Pasini, IRI's Administrative and Financial Director Salim Kfoury and the Ministry of Industry's media adviser Joseph Al Matni.**

Dr. Hussein Hajj Hassan has called upon the president Aoun to offer his patronage of the "Support for Industrial Cities Development in Lebanon" ceremony, jointly with international donors and financing institutions. During the event, the results of scientific and economic studies, about the feasibility of three prospective industrial cities, will be published. These cities are planned to be built in Terbol, Baalbeck and Al Jlayliyah in the Chouf region. They will create thousands of jobs and will present investment opportunities in the industrial sector in remote regions, firmly establishing members of these communities in their villages, limiting their exodus towards the capital or reducing their emigration abroad in search of better living conditions.

This project is the outcome of a collaboration between the Lebanese Ministry of Industry (MOI) and the United Nations Industrial Development Organization (UNIDO), in implementation of the integrated and developmental vision set by the MOI until 2025, at a cost of 110 million euros. Italy granted a donation of 500 thousand euros in order to finance the comprehensive preliminary studies, in addition to a very soft loan of 7 million euros to start funding the infrastructure project in the areas mentioned. Furthermore, very advanced negotiations are ongoing with countries and international funds in order to finance the whole cost. There is also a serious willingness to develop new industrial cities in other regions.



The Minister of Industry, Dr. Hussein Hajj Hassan, also invited His Excellency the President of the Republic General Michel Aoun, to take part in the groundbreaking ceremony for the construction of a new and modern IRI building, which will be self-financed by savings the institute is achieving as a result of its sound and judicious management. The new building is part of the integrated services provided by the Industrial Research Institute with the utmost degree of integrity, transparency and professionalism. It also comes in the context of a full cooperation with the Ministry of Industry and other departments, along with academic and research institutions, in both the public and private sectors, in order to develop the applied scientific research, which will benefit the national industry and the Lebanese economy.

The institute includes research and study centers, as well as dozens of globally accredited laboratories in diverse specialties. IRI became a member of international research organizations and uses a wide range of scientific applications through the internet and social media networks. Moreover, the institute is converting a part of its energy into the solar energy and the cleaner production.



Ministers Hajj Hassan and Tueni praise IRI's transparency and achievements  
 Dr. Frenn: "IRI is at the forefront of scientific research and technological studies and activities. The savings achieved by the institute will fund a new complementary and modern building."

**On March 21, the State Minister for Combating Corruption, Nicolas Tueni, visited the Industrial Research Institute in Hadath (within the Lebanese University campus). He was received by the Minister of Industry Dr. Hussein Hajj Hassan, IRI's Director General Dr. Bassam Frenn and members of its Board of Directors. Tueni joined the meeting held by the Board of Directors to discuss the institute's agenda.**

He attended the deliberations and the decision-making process in light of objective and accurate data. The Board was discussing the clause of calling for tenders to build a new and modern building to be added to the institute, through self-financing thanks to savings the institute is achieving as a result of the Director General's sound and judicious management, according to Hajj Hassan.

Dr. Frenn gave a detailed explanation on the development of activities inside the institute and different sections and laboratories, which are certified and accredited by American and European labs accreditation boards and bodies, particularly French and German organizations.

He described the fast-growing, advanced and transparent working processes inside the institute, as the operations became fully automated, allowing the applicant to track his operation online, without having to follow up the operation in person.



Dr. Frenn briefed the ministers on the programs, activities and projects carried out by the Industrial Research Institute, in partnership with the European Union, to develop, modernize and shore up the Lebanese industry. "The Industrial Research Institute is increasingly interacting with the public and private sectors, legalizing the imports and exports by controlling and regulating them in order to comply with requirements and standards. IRI is taking the lead in many fields of scientific researches and studies and advanced technological activities, amid its partnership with global and European research and scientific institutions, which are qualified and

well-recognized. The institute is also developing its laboratories and equipping them with the best equipment, while adopting advanced testing mechanisms conforming to European standards," explained Dr. Frenn.



### ***Minister Hajj Hassan***

Then, Dr. Hajj Hassan welcomed Mr. Tueni saying, "IRI has a long and proven record of achievements. Despite its total destruction during the war, its reconstruction was undertaken after 1991, before starting a long journey of expansion

from 10 employees in 1997 to 159 today, and from a budget of 1 million LBP in 1997 to 10 billion LBP now, and from one laboratory almost completely destroyed in 1997 to dozens of globally accredited laboratories in dozens of fields.”

The Minister of Industry added that “IRI became a member of international research organizations and uses a wide range of scientific applications through the internet and social media networks. It is also converting a part of its energy into the solar and cleaner energy production. Moreover,



we will finish updating the institute’s rules of procedure in order to promote modernization, transparency and productivity. We consider that there are many iconic landmarks in the Lebanese State, the most prominent of them being the IRI. The institute has two key roles, in the scientific research and the laboratory tests.”

“We are proud of the role played by the Industrial Research Institute and the transparent and successful employees at all levels. The State did not contribute to IRI’s budget since six years. Nevertheless, it could achieve savings that will finance the construction of a new building. It is only through transparency and productivity that the institute made these achievements. The ministers who have preceded me, the former and current members of the Board of Directors, the Director General and the staff, are credited with this success,” he concluded.

### ***Minister Tueini***

In his address, minister Tueini praised the virtues of Mr. Hajj Hassan, describing him as a hardworking minister, eagerly defending the interests of industrialists, farmers and producers in the cabinet.

“I am proud of visiting the Industrial Research Institute, this leading and successful institution. IRI is definitely the shield safeguarding the Lebanese society against defective goods, and helping to develop its production. This is a shield of knowledge, manufacturing and innovation. As His Excellency President Michel Aoun says, we will strive to convert the rent-based and occasional economy into a productive and knowledge-based economy, with Lebanon’s innovative human capital. We can reach this set goal as long as we have the national will. I confirm IRI’s role in strengthening the infrastructure of industry, and preserving our independence, not to mention its crucial role in protecting Lebanon from faulty products crossing our borders,” declared the minister.



“Today, Lebanon became a free country, immune to both the Israeli occupation and the religious extremists. Its border is inviolable thanks to the strength of its people. The production helps organizing the society. We are not a broke country, and it is not completely corrupt; stop the self-flagellation. We should put an end to this confusion and bewilderment, not everybody is suspicious, dishonest or corrupt. Lebanon has creative and innovative potentials; we should preserve our independence, and we can cut the debt by approving a public budget with a clear economic vision,” said Tueini.

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### ***Visit to IRI’s premises***

Finally, ministers Hajj Hassan and Tueini toured the premises with Dr. Frenn and the Board of Directors’ members, visiting the different sections, departments and laboratories.

IRI graduates LU engineering students after a welding session  
 Minister Hajj Hassan: Foreign countries protect their industry and trade;  
 Lebanon should protect its industry alike  
 Dr. Frenn: We should adopt knowledge-based, technological and smart  
 industries  
 Dr. Younes: The Faculty of Engineering implements projects compatible  
 with the manufacturing needs

For the fourth consecutive year, the Industrial Research Institute graduated students from the Faculty of Engineering at the Lebanese University, after successfully completing a specialized training session at the IRI's Lebanese Welding Center. The graduation ceremony was attended by the Minister of Industry Dr. Hussein Hajj Hassan, IRI's Director General Dr. Bassam Frenn, Faculty of Engineering's dean at LU Dr. Rafik Younes, as well as directors, teachers and students.



***Dr. Frenn: We reiterate our commitments to the principles with our success***

In a speech, Dr. Frenn explained that the institute began “few days ago, the excavation operations to lay the foundations of the IRI's new building, reflecting the institute's drive and its management's prosperous vision. We reiterate our commitments to the principles that were the key to our success two years ago; these principles are based on the integrated services IRI is offering in a great dedication. We are fully willing to cooperate with both the public and private academic and research institutions in Lebanon, in order to develop the applied scientific research, which will benefit the national industry and the Lebanese economy.”

“Lebanon is experiencing delicate, critical and exceptional circumstances at different levels. At the socio-economic level, we completely agree with minister Hajj Hassan on the necessity of setting a well-defined governmental economic policy with very clear objectives. At the IRI, we are aware more than anyone else of the considerable decline the economic life is witnessing, in both imports and exports. Admittedly, the security circumstances in the region are adversely affecting the volumes of operations. But the centers of studies and researches at the IRI are open to all investors and industrialists to submit plans, and provide visions, advice and guidelines towards reaching new and stable markets to some extents, or at least less turbulent than the traditional markets that the Lebanese industrialists are dealing with,” said Dr. Frenn.



Dr. Frenn's recommendation was to introduce new knowledge-based, technological and smart industries, where the high added-value comes from the human capital and the scientific competences. He finally urged the engineers who will enter the labor force to be revolutionary innovators in their societies and environments, and to bring in a qualitative change.



### ***Dr. Younes***

Dr. Rafik Younes praised, in his address, the relationship and cooperation between the Faculty of Engineering and the Industrial Research Institute, commending the distinctive role played by the President of the Lebanese University, Dr. Fouad Ayoub. He enumerated projects implemented by the faculty, such as updating programs and adding new majors, while aligning them with the manufacturing needs and areas of work.

### ***Minister Hajj Hassan***

The Minister of Industry, Dr. Hussein Hajj Hassan, delivered a speech highlighting the wrong economic policies of the last twenty years, which are taking their toll on the Lebanese people and the national economy, in the absence of any fast economic reform policy aimed at redressing the situation. He pointed out to the agreements Lebanon signed with the European Union and the Arab countries, without achieving the intended benefits at the economic level.

“I am not against the trade agreements, but I am opposed to some of their clauses. I support signing some agreements to organize the trade relations and commercial exchange between Lebanon and its trade partners,” explained the minister. He stressed the importance of increasing the GNP, reducing the consumption, boosting the investments opportunities and decreasing the trade deficit, in a progressive policy aimed at raising the exports by 3 billion dollars and dropping the imports by the same figure.

“The foreign countries protect their industries and trades. How can the Lebanese manufacturing sector be competitive, without protecting and supporting it? Competition is not limited to the quality and innovation, but includes the cost level too,” added Hajj Hassan.

The minister agreed with Dr. Frenn’s recommendation of backing the smart industry, calling on European Union countries to lift restrictions and fees on importing technology programs. He explained that Lebanon needs 1.5 billion dollars to invest in the industrial sector in order to create 30,000 jobs annually, and this investment will need a bold and historic decision.

“What brought the American president Donald Trump to the region, other than imposing the export policy from his country towards the Gulf region? As a result, he derived dozens of billions of dollars, totaling 400 billion US dollars, draining the Arabic reserves of their funds. How all this money became readily available amid the austerity policies announced by the GCC countries, which are abstaining from paying contractors their dues? Did the barrel of oil suddenly bounce to 1,000 dollars and we weren’t aware of it?” asked Hajj Hassan. “Hence, we have to curb the imports and boost the exports as a start to any solution,” he added.

### ***Lebanese Welding Center***

IRI constantly takes part in the activities of the International Institute of Welding (IIW) and the International Committee for Non-Destructive Testing (ICNDT), where Lebanon is an active member. The Lebanese Welding Center, which is affiliated to the Industrial Research Institute, is the certified institution according to Law number 423, which allows the IRI to give accreditations to the institutions and the people carrying out the necessary technical operations, in terms of welding, assessing the welding quality and other. Consequently, the certifications issued by the institute are reliable, accredited and mandatory to the projects using welding or monitoring welding processes.



IRI hosts a meeting of the Arab Industrial Research Centers  
 Minister Hajj Hassan: You are filling the political vacuum in the Arab world  
 Dr. Frenn: We have to discuss with the Lebanese officials and set a unified Arabic vision  
 Sakr: AIDMO launched the “Arab Initiative for the Application of Nanoscale Science”

In November 14, the Industrial Research Institute hosted the 17th meeting of the Coordination Committee for Industrial Research Centers in Arab States, and the Arab Forum On Ways To Promote Partnership With Industry, in the presence and under the patronage of Minister of Industry Dr. Hussein Hajj Hassan, IRI's Director General Dr. Bassam Frenn, Director General of the Arab Industrial Development and Mining Organization (AIDMO) Eng. Adel Sakr, Director General of the Ministry of Industry Dany Gedeon, LIBNOR's Chairman of the Board of Directors Eng. Habib Ghaziri, LIBNOR's General Director Eng. Lena Dergham, directors and representatives of Arab research centers, as well as industrialists, professionals and researchers.



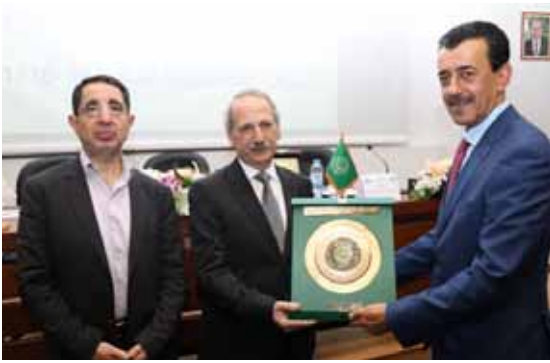
### *Dr. Frenn*

After the national anthem, a documentary on IRI's establishment and services was screened. Afterwards, Dr. Frenn addressed the audience saying, “This event is particularly important because Lebanon is hosting two scientific and economic activities at the same time, within the Industrial Research Institute. Considering these two significant events, our role should extend beyond its scientific and research framework. As scientists, researchers and experts, gathered in the same place for the sake of science and knowledge, we should capitalize on this role and take advantage of these developments in the interest of a unified Arab world, united by the same prospects, aspirations and challenges.”

“It is not easy to realize what politicians were, and still are, unable to achieve. Yet, it is not impossible to work for the good of our countries and our people, to safeguard our competences, capabilities and resources. However, a question remains as to whether the common Arab market is already an illusion? Or is it still an objective we are really convinced that we can reach, through actions not only words?” he asked.

“Can't we overcome the obstacles through our solidarity, and formulate a unified Arab vision, taking into account the common Arab interests? As Arab research centers, what are we doing to achieve this objective? Will we remain inactive in the face of the political will? In what principle we believe? The ‘divide and rule’ or the ‘united we stand’ principle? Are we daring enough to discuss with our officials and convey to them the importance of openness, exchange and the flow of goods between Arabs, as well as the commitment to the bilateral and trilateral agreements and treaties,





and those falling within the scope of the Arab League, the Arab Economic and Social Council and the Council of Arab Ministers of Industry? ...These are serious questions of concern to all of us. We should all answer them adequately and sincerely,” concluded Dr. Frenn.

### ***Eng. Sakr***

In his address, Eng. Adel Sakr said, “the Arab Industrial Development and Mining Organization (AIDMO) attached great importance to the rapid technological advances and

changes in the world. It provides all possible assistance to promote sustainable Arab industrial development. In this framework, AIDMO launched the ‘Arab Initiative for the Application of Nanoscale Science and Technology and Associated Technologies’, and to draw up its road map and an executive program to implement it.”

“AIDMO also carried out many activities that contributed to highlight future industries linked to technological advances, including the preparation of technical studies on industrial applications of nanotechnologies in the Arab world, the promising investment opportunities, the manufacturing feasibility of nanotechnology projects for water desalination and use of solar energy and determining the status of nano science and technologies in the Arab world. Our meeting about ways to promote partnership with industry (uses of nanotechnologies) is considered an extension to these activities and events allowing, God willing, the in-depth identification of available prospects in nanotechnology applications inside the Arab world, and the stimulation of the Arab world to embrace these promising industries to support the sustainable Arab industrial development.”

### ***Minister Hajj Hassan***

In his speech, Mr. Hajj Hassan said “I am pleased and honored to take part with you in the launching of two important scientific events, in connection with the industry in Lebanon and the Arab world. They are highly significant events taking place in Beirut amid the current circumstances, which confirms the status of Beirut and the joint action between the Arab countries.”

“Lebanon and the Arab countries boast of many intellectuals, scientists and industrialists in research centers. However, we do not have national, intergovernmental or nationalist research policies related to a joint industrial and research action. The decline of our economy and scientific output is a strong proof, and this is resulting in an Arab and Lebanese brain drain towards countries adopting research and industrial policies. Yet, this will not prevent us from continuing the scientific researches in Lebanon and the Arab world,” he explained.

“The second evidence on our decline is the negative balance of trade, where imports significantly exceed the exports. Wherever the politicians are failing, you are filling the political vacuum in Lebanon and the Arab world. I encourage and support you to coordinate and collaborate in the framework of a joint scientific research, in the hope that the Arab leaders and politicians will benefit from the important future recommendations,” added the minister.

At the end, plaques of appreciation were awarded to the minister Hajj Hassan, Dr. Frenn and Eng. Sakr.



2



Activities of  
the Director General





**He is the vigilant and watchful eye on the Industrial Research Institute's activities. He sets out plans, implements projects and always strives for the best outcomes. With the help and support of his assistants, he leads the institute forward, overcoming countless obstacles and hurdles.**

**With his constant participation in official activities, along with the Minister of Industry and other ministers, he makes all necessary efforts to expand and diversify the institute's activities. He supervises internal relations and activities and takes part in external events.**

**He delegates IRI's diligent, energetic and hardworking engineers and staff, to represent the institute in local and international activities. He constantly preserves IRI's good reputation.**

**He is the Industrial Research Institute's Director General, Dr. Bassam Frenn.**

## I - Internal Activities

### IRI and NDU launch a Food Advisory Unit to offer counseling and guidance, and implement food development projects for food companies and industrial groups in Lebanon

The Industrial Research Institute's Director General, Dr. Bassam Frenn, emphasized the importance of building bridges to connect universities and academic institutions with the labor market and the manufacturing, production and service sectors.

To reach this target, IRI continued establishing links with universities in Lebanon. After the Lebanese University (LU) and the Université Saint-Joseph (USJ), NDU's President Reverend Father Walid Moussa and IRI's Director General Dr. Bassam Frenn signed a Memorandum of Understanding (MoU) between the university and the institute to promote cooperation and share experience, particularly in the fields of research, studies, laboratory tests and food safety.

The signing ceremony was held in NDU's campus, in Louaize. It was attended by the dean of Faculty of Nursing & Health Sciences Dr. Antoine Farhat, the Faculty Chairperson Dr. Jessy El Hayek, the Vice-President for Academic Affairs Dr. Elie Badr, the Vice-President for Cultural Affairs and Communications Mr. Souheil Matar, faculties' deans and senior directors in the institute.



#### Agreement Objectives

Mr. Ramzi Bhamdouni explained that, through this agreement, a Food Advisory Unit would be established to provide counseling and guidance, and implement food development projects for food companies and industrial groups in Lebanon.

#### *Father Moussa*

A welcoming address was delivered by Father Walid Moussa who praised the Industrial Research Institute's role in Lebanon, regarding the development of innovative and industrial researches and projects. "The university role, through



the academic majors, is to urge the students to assume a social and humanitarian responsibility (...) together we will give the human development our utmost priority," said Fr. Moussa.

### ***Dr. Frenn***

IRI's Director General praised the leading role of Notre Dame University-Louaize, academically and educationally, and for graduating future generations and leaders in Lebanon. He emphasized the importance of building



bridges connecting universities and academic institutions with the labor market and the manufacturing, production and service sectors.

Dr. Frenn stressed that competition should be limited to the quality of education, which should be upgraded in order to graduate highly competent students having the academic qualifications that will enable them to enter the labor market, gain experience and adapt to the new requirements of this world.

### ***Common Vision***

On food safety, IRI and NDU share a common vision concerning the importance of developing the agri-food sector in Lebanon, as a favorable factor in ensuring a balanced regional growth. The institute and the university agree on a cooperation framework, by capitalizing on the different academic majors available. Hence, the resources, equipment and expertise that will be part of a scientific platform, will not be limited to the food sector, but will include all kinds of researches that will be conducted at the university.

## **IRI and German PTB organize a regional workshop in legal, scientific and industrial calibration**

**As part of a cooperation and technical support project, the Industrial Research Institute, in partnership with the German federal institute of metrology Physikalisch-Technische Bundesanstalt (PTB), organized a regional workshop in legal, scientific and industrial metrology. The workshop was attended by experts and officials from the Ministry of Economy and Trade, the Industrial Research Institute and the German PTB institute, as well as participants from Egypt, Palestine and Jordan.**

The workshop was held at IRI's premises where the participants discussed different ways to enhance cooperation, promote the exchange of expertise, training and knowledge, and develop a future vision for a joint action during the next three years.

After the workshop, the participants visited the laboratories, departments





and research centers inside the institute. They were impressed by IRI’s huge progress and by its working methods, which are complying with the latest universally adopted methods.

The Industrial Research Institute’s Director General, Dr. Bassam Frenn, congratulated the workshop participants and encouraged them to continue their support, cooperation and collaboration in order to achieve the desired scientific and economic goals.

Dr. Frenn also thanked the German PTB institute of metrology for all the support and cooperation and expressed his willingness to consolidate relations by organizing training sessions and workshops, in addition to the exchange of visits, knowledge and experiences, for the benefit of all.

### Dr. Frenn places IRI’s research centers and laboratories at the disposal of the Society of Management & Development Consultants (SMDC)

The Industrial Research Institute’s Director General, Dr. Bassam Frenn, received a delegation from the International Council of Management Consulting Institutes (ICMCI) led by its Vice-Chair Ilse Ennsfellner, and from the Society of Management & Development Consultants (SMDC) headed by Dr. Mohanad El Assaad.

The delegation mentioned IRI’s advanced role in research and consultancy, particularly in international consultancy services. They discussed the importance of enhancing cooperation between the institute and both the ICMCI and the SMDC in terms of developing the fundamentals and the preparatory arrangements needed by Lebanese consultants in their work inside Lebanon and abroad, notably in providing them with training, confidence and competence in conformity with international standards and requirements.

Dr. Frenn expressed his readiness to place IRI’s research centers and laboratories at the disposal of the Society of Management & Development Consultants (SMDC) in order to achieve the desired goals.





## Workshop to Boost Lebanese Exports to Sweden

### Dr. Frenn calls for laying a strong foundation to bolster Lebanese exports to Sweden

### Sweden's Ambassador: Trade can contribute to the economic growth Gedeon underscores the Lebanese industry's need for new markets

In partnership with the Industrial Research Institute, the Swedish Embassy in Lebanon and Sweden's National Board of Trade, the Ministry of Industry organized a workshop in IRI on "Ways To Increase Lebanese Exports to Sweden", primarily the food industries and the alcoholic beverages. The Director General of the Ministry of Industry Mr. Dany Gedeon, IRI's Director General Dr. Bassam Frenn, Sweden's Ambassador to Lebanon Mr. Jörgen Lindström, the Representative of the Minister of Economy and Trade Mr. Mohammad Abou Haidar, officials from the Ministry of Industry and the IRI, in addition to experts from Sweden and industrialists, participated in the workshop. This event was the first activity involving an exchange of experience, and fostering economic and trade relations between Lebanon and Sweden.



#### ***Dr. Frenn***

At first, Dr. Frenn gave a welcoming speech confirming IRI's role, since its establishment 60 years ago, in supporting the Lebanese industry sector and the institute's contribution in increasing its productivity and efficiency, as well as the overall development of the national economy.

He talked about the expansion of IRI's activities since the 1990's, in the areas of consultancy services, applied researches, laboratory tests, controls and verifications, and the accreditation certificates, through specialized centers affiliated to the institute, namely the Euro-Lebanese Centre For Industrial Modernization (ELCIM), the Centre for Innovation and Technology (CIT) and the Lebanese Cleaner Production Center (LCPC). Moreover, IRI's globally accredited laboratories cover over 400 different methods of internationally recognized lab tests. He explained how the Industrial Research Institute, in collaboration with the Ministry of Industry, the European Union and the UNIDO, technically implemented the MedTest II program aimed at supporting eight new institutions in the food sector. He called for cooperation in laying a strong and solid foundation to bolster Lebanese exports to Sweden, particularly in the food industries.

#### ***Ambassador Lindström***

The Swedish ambassador to Lebanon, Mr. Jörgen Lindström, pointed out that the workshop is the result of Sweden's commitment to world trade, being convinced that the trade can contribute to economic growth. As an example, he described how Sweden, which was a poor agricultural country in the 19th century, was able to become one of the most developed countries in the world.

He explained that the topics that were discussed covered the food safety infrastructure and the world trade development infrastructure. Mr. Lindström said that Sweden would increase its support to Lebanon, declaring

that a Swedish embassy would be opened soon in Lebanon, as well as moving the regional office of the Swedish International Development Cooperation Agency (Sida) to Beirut.

“We focus the majority of our work on the Syrian crisis and its fallouts inside Syria and the neighboring countries like Lebanon. Sweden recognizes the difficult situation the Syrian people and the hosting communities are facing. Annually, Sweden contributed over 500 million krona in direct humanitarian aids to the Syrian crisis.

Starting last year, Sweden developed a five-year strategy allocating 1.7 billion krona for the region,” said the ambassador.



### ***Mr. Gedeon***

Mr. Gedeon welcomed Sweden’s ambassador and thanked the Industrial Research Institute for hosting the workshop and the constant cooperation and coordination.

He commended the initiative, being the first between Lebanon and Sweden in organizing a workshop with the Swedish National Board of Trade. This workshop aims at being aware of the rules, conditions, standards and requirements helping to streamline the export of Lebanese goods to Sweden.

He stressed that the Lebanese industrialist, amid a global economic crisis and a war ravaging the region, needs to find new markets to sell his products. Statistics, studies and the participation of economic experts and engineers from the Ministry of Industry in specialized training sessions in Sweden, show that the latter needs products made in Lebanon. As a result, organizing this workshop was a necessity, and industrialists from the food industries and alcoholic beverages sectors were invited to be in direct contact with Swedish experts. These experts will explore the methods, means and rules that will allow the export of foreign goods to Sweden. He hoped that the industrialists would benefit from this workshop, expecting that this meeting would be fruitful and a first step in strengthening the trade relation between Lebanon and Sweden.

## II- External Activities

### IRI represents Lebanon internationally as an associated member in EUROLAB

**Bologna, Italy 03-04/05/2017**

**Paris, France 16-17/1/2017**

The Industrial Research Institute, represented by its Director General Dr. Bassam Frenn and the Director of Laboratories Professor Joseph Matta, participated in the general assembly held in Bologna (Italy) on 03-04/05/2017, and in Paris (France) on 16-17/1/2017, as an international associated member in the European Federation of national associations of measurement, testing and analytical laboratories (EUROLAB).

The participants discussed technical topics in relation to the development of applied researches and analyses. IRI took part in the deliberations on the draft amendment to the ISO 17025 standard, referring to the general requirements for the competence of testing and calibration.

In this field, the Industrial Research Institute placed Lebanon in an international scientific position, thanks to the efforts of its staff and the capacity of its general management in setting a future vision to reach a promising international scientific position.



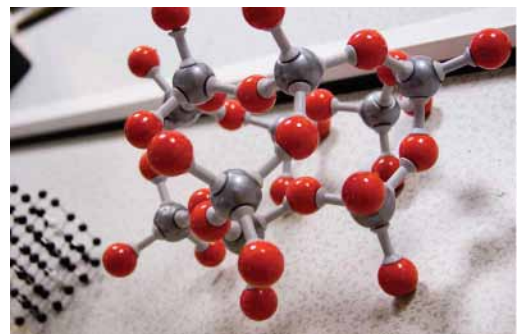
### Dr. Frenn participates in the 9th World Congress on Materials Science and Engineering in Rome

**June 12 to June 14, 2017**

**Holiday Inn Rome Aurelia**

IRI's Director General, Dr. Bassam Frenn, participated from 12 to 14 June 2017 in the 9th World Congress on Materials Science and Engineering, which was held under the theme "Outlining the forefront research in the field of Materials Science and Engineering".

This Congress aimed at sharing new ideas, experiences and knowledge among professionals, industrialists and students from research areas of materials science, nanotechnology, chemistry and physics through interactive discussions and technical sessions at the event. In addition to that, the conference offered a space for companies and/or institutions to present their services, products, innovations and research results.



3



Laboratory Services,  
Observations and  
Activities

## IRI carried out 1.4 million operations in 2017 45,000 customs files, 353,000 lab tests and 650,000 gas cylinders

Since 1998, when Dr. Bassam Frenn became IRI's Director General, the institute maintained its successful course of activities, enhancing it with an ongoing and steady growth. Dr. Frenn turned the IRI into a fully-fledged scientific institution, unaffected by the surrounding uncertainties caused by wars and economic crises, which undermined development and growth. Dr. Frenn also succeeded in protecting the IRI from internal political tensions and the economic slump, confirming its commitment to work ethics and operational success, and promoting all sectors of the national economy through scientific data and results, strengthening it locally and internationally.

The IRI remained a leading scientific institution in Lebanon and the Middle East, capable of placing its scientific resources, laboratories and human capital, not only at the disposal of the industrial sector, but also to serve the public sector. Therefore, IRI allowed financial savings and offered a scientific support - achieving rapid results - in the campaign of controlling and inspecting the agricultural, manufacturing and health products, meeting the needs of the Ministry of Economy and Trade, the Ministry of Industry and the Ministry of Public Health, in addition to the Ministry of Agriculture. Moreover, the institute was controlling the new liquefied gas cylinders. On average, the IRI conducted up to 5,002 operations on a daily basis in the field of tests and customs files alone, achieving one of the biggest work operations among Lebanon's institutions.

### **The tests, examinations and verifications were distributed as follows:**

- 353,307 compliance tests and analyses were conducted by IRI's laboratories during 2017, decreasing by 1,665 operations compared to 2016, making less than 0.5%, and 1,261 daily tests on average.
- In addition to these tests, the institute carried out 304 external examinations, and inspected 649,776 locally manufactured gas cylinders and 5,000 imported gas cylinders.
- Standardization and calibration tests increased by 2,385 tests to 19,689, rising by 13.8%.
- In the conformity assessment, IRI inspected imported goods checking their compliance with mandatory requirements, and examining 44,990 files, at a daily rate of 161 files.
- The total number of controls conducted by the staff, inside and outside the institute, reached 1,400,768 examinations, tests and inspections.

Hence, the Industrial Research Institute demonstrated its competence as a vigilant scientific institution capable of meeting the needs of the public administration and the private sector by conducting accurate scientific and technical tests in a wide range of sectors, not to mention the scientific researches and studies in different economic fields.

## Tests and Analyses

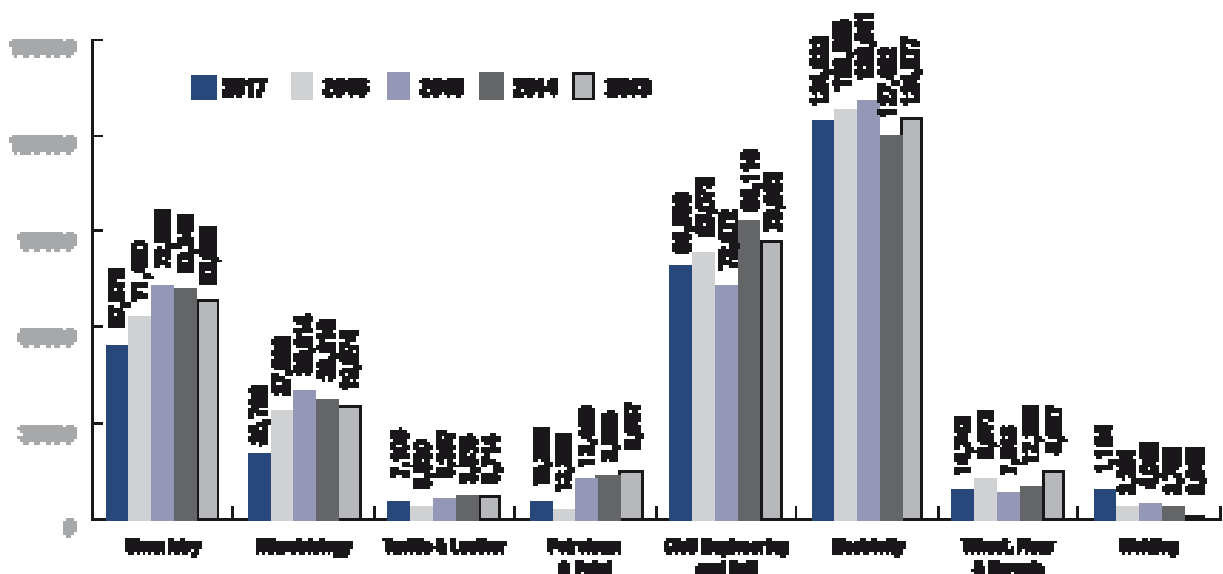
In general, Electrical Laboratories outpaced other laboratories in the number of tests they performed in 2017, by almost 35.3%, thus preceding the Engineering and Soil Laboratories, whose share in the experiments was of 24.6%. The Chemical Laboratories accounted for 19.2%, while Bacteriological tests reached around 35,000, or 10.6% of the total, followed by Petroleum Laboratories, then the Central Laboratory for grains, flour and bread research, then the Textile Laboratories.

Tests included 51,507 samples of the various mentioned types.

The Welding Laboratory, for its part, performed 1,194 experiments on nearly 7 samples.

### Number of tests for each Lab

Laboratories	2017	2016	2015	2014	2013
Wet & Physical Chemistry	67870	71400	72850	63349	53806
Microbiology	35700	37620	39614	33816	19974
Textile and Leather	7100	6830	6397	3835	5714
Paint and Petroleum	15200	13200	12450	2895	5037
Civil Engineering and Soil	86868	93073	72972	83110	78833
Electrical	124633	119595	130011	127402	124577
Bread ( CLBW)	14742	9973	7543	12356	8837
Welding	1194	3281	4015	3785	9045
<b>Total</b>	<b>353307</b>	<b>354972</b>	<b>345852</b>	<b>330548</b>	<b>305823</b>





**According to statistical tables, the laboratories activities were as follows:**

### *Chemical and physico-chemical laboratories*

The total number of experimental operations inside the chemical and physico-chemical laboratories reached 67,870, decreasing by 3,530 tests or 5%, and accounting for an almost 19.3% of all laboratories tests.

### *Bacteriological analyses*

There was a decrease in bacteriological experiments, due to the declining number of samples sent by the public sector, and aimed at ensuring the safety of water, food and others. 35,700 tests were performed in 2017, decreasing by 1,920 tests, or 5.1%, from 2016. Overall, they represented 10.1% of the total number of experiments.

### *Textile, leather and rubber laboratories*

There was an increase in the number of tests and analyses in these laboratories during 2017, proving that the local textile and garment industry has restored some of its full production capacity. This recovery was due to the decrease in exports from Syria, or the inflow of skillful Syrian workforce to Lebanon. The number of these experiments and tests reached 7,100 representing 1.9% of total experiments, and increasing by 1.8%.

### *Petroleum and derivatives laboratories*

Paint and petroleum laboratories also made a solid jump from 2,895 tests in 2014 to 15,200 tests in 2017, accounting for 4.3% of the total activity.

### *Civil engineering laboratories*

The civil engineering and soil laboratories pursued their regular activity, despite the decrease they witnessed compared to 2016, after conducting 86,868 tests accounting for 24.7% of the total. The number of these tests reflects the strong construction sector in Lebanon, and the high demand for various building materials and equipment.

### *Electrical laboratories*

These laboratories restored their pace of growth and tests rose by 4.4% over the previous year. The number of electrical devices experiments reached 124,633 representing 35.4% of the overall laboratories operations.

## **External Inspection**

<b>Activity</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Gas storage Tanks Inspection	410	420	170	162	155
Fuel Tanks Inspection & Calibration	53	51	70	93	50
Steam Boiler Inspection	120	132	108	81	99
Various Pressure Devices Inspection					
<b>Total</b>	<b>583</b>	<b>683</b>	<b>348</b>	<b>336</b>	<b>304</b>
Local gaz cylinders inspection & control	24,000	8,000	8,000	615,750	649,776
Imported gaz cylinders inspection & control	0	15,000	29,500	0	5,000

### *The Central Laboratory for grains, flour and bread research*

“IRI served the Ministry of Economy and Trade, given its responsibility towards performing laboratory tests on imported wheat, as well as inspecting the majority of imported and locally produced goods”, said the Minister of Industry, Dr. Hussein Hajj Hassan, thanks to the close cooperation between the ministry and the institute. Indeed, the Central Laboratory for grains, flour and bread research tests increased by around 48% in 2017, from 9,973 to 14,742 tests.

### *Welding laboratories*

As for the number of welding operations, it reached 1,194, decreasing by 63%.

### **Metrology and calibration laboratories**

Metrology laboratories continued their steady activity, achieving growth in the number of tests. In 2017, they saw an increase of 2,385 operations, or by 13.8%, and performed 19,689 tests, compared to 17,304 experiments in 2016.

These laboratories received 2,148 metrology instruments, in an increase of 261 devices from 2016, and they were used to conduct 19,689 tests.

The tests covered many fields, namely temperature, pressure, force, mass, dimensions and electricity.

### **The activities of the laboratories included:**

#### *Temperature*

Temperature laboratories received 515 instruments and performed 5,150 tests, representing an increase of 30 tests, or 0.6%, at a rate of 10 tests per device, which is the same rate since 2010.

Technical Subjects	2013		2014		2015		2016		2017	
	Item	Test	Item	Test	Item	Test	Item	Test	Item	Test
Temperature	431	4310	408	4080	426	4260	512	5120	515	5150
Pressure	59	472	59	472	68	544	87	696	96	768
Force	6	48	2	16	3	24	5	40	10	95
Mass	820	7885	911	8480	964	9024	1062	9680	1298	11844
Length	68	544	60	480	52	416	115	920	163	1304
Electricity	117	936	92	736	54	432	63	504	29	232
Other (torque meter, sound level, lux meter,...)	9	72	8	64	47	376	43	344	37	296
<b>Total</b>	<b>1510</b>	<b>14267</b>	<b>1540</b>	<b>14328</b>	<b>1614</b>	<b>15076</b>	<b>1887</b>	<b>17304</b>	<b>2148</b>	<b>19689</b>



### *Pressure*

The laboratories received 96 instruments destined for the pressure measurement. They were used to conduct 768 tests, at a rate of 8 tests per device, which is the same previous rate.

### *Force*

Ten instruments were delivered to the metrology laboratories in order to measure the force. They were used to perform 95 tests, at a rate of 9.5 tests per instrument.

### *Mass*

The number of mass units reached 1,298 and they were used to conduct 11,844 tests, at a rate of 9.1 tests per unit. The mass units and tests increased at the same rate of 22.2%.

### *Dimensions*

The number of units increased to 163, and tests rose to 1,304, both by 41.7%.

### *Electricity*

The number of tests on electrical equipment decreased to 29 instruments in 2017, from 63 instruments previously, and to 232 tests from 504 previously, by nearly 54%.

### *Other tests*

As for the other instruments, their number fell from 43 to 37, and saw 296 tests.

## Customs Files

### **IRI Verified 44,990 Customs Files in 2017**

The number of customs files scrutinized by the Industrial Research Institute rose by almost another one thousand during 2017, totaling 44,990 compared with 44,004 files checked in 2016. The increase was of 2.24%, reaching 986 files.

Taking into account that IRI verifies exclusively the files that come under scrutiny, the number of these files soared by 2,336 from 30,726 in 2016 to 33,062, or by 7.6%.

In fact, the Syrian war and the closure of land border crossings to transit vehicles transporting merchandise by land from Jordan, Iraq, Turkey and sometimes from Saudi Arabia and Iran, led to a decline in the transit of goods, in both directions, through the Masnaa border crossing linking Lebanon to Syria.

The IRI is checking and verifying customs files, as part of several tasks entrusted to the institute since 2005, in order to ensure the conformity of imported products to the mandatory Lebanese standard specifications.

In the absence of the events that Syria and Iraq are witnessing, and affecting the transit through the Masnaa border crossing, the number of customs files under consideration would have spiked and picked up.

After the review, the files that were subject to scrutiny represented almost 73% of their total number. Eventually, 1,509 files did not comply with the mandatory requirements, accounting for 3.35% of the overall number. Hence, 1,450 were rectified, while the other 59 files were rejected.

The IRI is verifying around 70% of the files in their transit stations or under horizontal specifications. All the files are reviewed and returned to the applicants on the same day, while 30% of the goods under investigation enter warehouses before they are allowed to be marketed.

## Customs Files by Type

	Common Files	Vehicle	Textile	Civil Engineering	Pressure	Paint	Energy	Mechanical	Elevators	Medical	Electrical	Chemical	Pre-Shipment	Grand Total
Number	3737	1629	3018	4115	180	2626	203	1085	209	6417	12493	7696	1582	44990
Files subject to	2642	1189	2489	4012	66	770	141	612	169	5661	8022	5707	1582	32062
Files not subject to	1093	440	529	100	114	1856	62	473	40	753	4464	1989	0	11913
Files not subject to after inspection	2	0	0	3	0	0	0	0	0	3	7	0	0	15
Percentage of files not subject to	29,30	27,01	17,53	2,50	63,33	70,68	30,54	43,59	19,14	11,78	35,79	25,84	0,00	26,51
Non-conforming files	320	0	54	281	1	20	29	0	0	76	716	12	0	1509
Percentage of non-conforming files	12,11	0,00	2,17	7,00	1,52	2,60	20,57	0,00	0,00	1,34	8,93	0,21	0,00	4,56
Rectified files	317	0	54	281	0	5	29	0	0	72	692	0	0	1450
Rejected files	3	0	0	0	1	15	0	0	0	4	24	12	0	59

## Customs Files by Entry Point

	Common Files	Vehicle	Textile	Civil Engineering	Pressure	Paint	Energy	Mechanical	Elevators	Medical	Electrical	Chemical	Pre-Shipment	Grand Total
Masnaa	1	0	1	0	7	1	5	2	0	0	3	33	0	53
Port of Beirut	2933	1489	2640	4033	147	2416	179	1030	197	1434	8557	5085	1582	31722
Arida	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Saida	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Port of Tripoli	91	73	132	32	2	44	1	4	1	4	91	252	0	727
Aboudiyeh	0	0	34	0	0	0	0	0	0	0	1	0	0	35
Beirut Airport	712	67	210	50	24	164	18	49	11	4979	3841	2326	0	12451
Average/Day	3737	1629	3018	4115	180	2626	203	1085	209	6417	12493	7696	1582	44990
	14,37	6,27	11,61	15,83	0,69	10,10	0,78	4,17	0,8	24,68	48,05	29,60	6,08	173,04

## The files were subdivided into the following industrial sectors:

### 1- *Files not subject to verification*

These are files received by the IRI, but not subject to any examination mechanism, because they are not governed by specific mandatory specifications that can be used for comparison. Their number increased from 4,594 in 2007 to 12,909 in 2016, after having surged to 13,071 in 2015. During 2017, they dropped again to 11,913 files. They are not central to the verification process; the IRI effectively reviews them, stating only that they are not subject to investigation on the same day of their reception.

### 2- *Pre-shipment verification*

The files of merchandises subject to prior verification in the exporting country, before being shipped to Lebanon, increased by 121 files or 8.2% compared to 2016, and reached 1,582 files in 2017.

### 3- *Horizontal specifications*

They represent 24.3% of the total number of files and 33% of the files coming under scrutiny. These files are reviewed and returned to the applicants on the same day. Their number increased from 4,300 in 2007 to 9,788 in 2016, and rose again to 10,935 in 2017.

### 4- *Verification of stocked merchandise*

These files are checked after stocking the relevant merchandise. Their number have risen from 13,057 to 13,360 in 2017, increasing by 303 files or 2.3%. They represent 29.7% of the total number of files and 40.4% of the files subject to investigation.

### 5- *Verification at border crossings*

The number of files subject to verification at border crossings increased by 15.9% to 7,150. Among these, 4,454 files were checked at the Beirut Airport, 2,626 files at the Port of Beirut, 10 files at the Masnaa border crossing and 60 files at the Port of Tripoli.

## Files distribution by type and border gates

Customs files subject to IRI's verification were distributed by merchandise type as follows:

Electrical items and devices accounted for the biggest share, with 27.8% of the total, reaching 12,493 files. Along with the chemical devices and goods, and medical instruments, they represented more than half of the files. The number of chemical files reached 7,696, representing 17.1%, while the medical instruments files totaled 6,417, or 14.3%, followed by the clay and soil files, which reached 4,115 constituting 9.1%. The common files accounted for 3,737 or 8.3%.

There were 3,018 files for textiles, representing 6.7%, and 2,626 for paints, accounting for 5.8%. The number of car tires files reached 1,629, the mechanical engineering files 1,085, the energy files 203 and the pressure device 180 files.

The Port of Beirut had a share of nearly 70.5%, with almost 31,722 files, followed by the Rafic Hariri International Airport in Beirut, with 27.7% or 12,451 files, and the Port of Tripoli with 727 files.

## Certificates of Accreditation

The Industrial Research Institute continued its efforts to strengthen and promote the Lebanese industry. Until the end of 2017, IRI awarded the ISO 9001 standard to 27 industrial institutions, the Environment Management System ISO 14001 to four institutions, the Food Safety System ISO 22000 to two institutions and the Medical Devices Quality Management Systems ISO 13485 to three institutions. It also provided one institution with the OHSAS 18001, which aims at developing a set of specifications for occupational health and safety management systems.

## Product Certification

This process allows a company to put the IRI Mark on the certified product, IRI granted the Certificate of "Product Certification" to 47 products from 11 different productive institutions.

## Qualified Individuals Certificates

IRI offers certificates to competent individuals enabling them to control the quality of systems and products, in cooperation with the French institution Moody.

These certificates were awarded as follows:

- Awareness according to ISO 9001:2015: 8 persons.
- IRCA transition course according to ISO 9001:2015 & 14001:2015: 5 persons.
- Internal audit course for ISO 9001:2015: 15 persons.

## Lebanese Welding Center Certificates

Under Law 423/2002 considering that “the Industrial Research Institute is designated as the Accreditation Body and the only organization authorized to issue certificates of conformity related to all types of welding in Lebanon”, the institute awarded 160 welding certificates through the Lebanese Welding Center (CLS), one certificate of inspection and 39 certificates of training in destructive testing.

## Electrical Laboratory Lab Equipment 2017

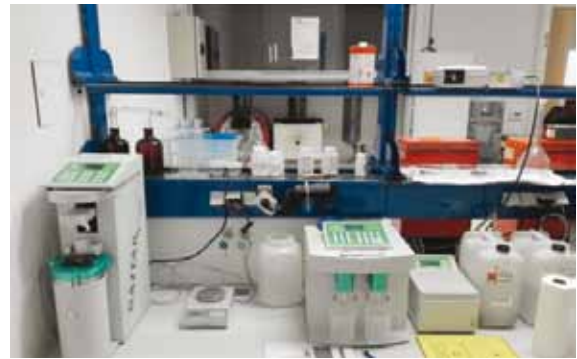
### Impact test apparatus (SCR ELEKTRONIKS)

The Impact test apparatus is intended to check the resistance of circuit breakers to mechanical blow. It is constructed in compliance with figures 9 to 13 of IEC 60898-1 and it includes the following main elements: pivot axis, striking element, mounting support and sheet of plywood.



### The Central Laboratory for Grains, Flour and Bread Research

In order to meet the increasing demand on accredited testing parameters of importance to wheat trade, the Central laboratory for grains, flour and bread research continuously Upgrades its technical capabilities by acquiring new high-tech equipment such as the newly installed Hagberg-Perten equipment for the determination of the “Falling Number”. Moreover, in order to maintain its status as an International Reference laboratory, the central laboratory chaired and participated in a technical evaluation and validation for ICC on two “Falling Number” and “Gluten” Equipment designed and produced by BASTAK Turkey. The results of the assessment will be published in 2018.



### Microbiology Lab

#### Multi-Color Bacterial Counting With the ColonyDoc-It™ Imaging Station

Chromogenic agents assist researchers in identifying bacteria of specific metabolism by color. The chromogenic substrate X-Gluc is used in a variety of applications for the detection of the  $\beta$ -glucuronidase enzyme. Upon reduction, X-Gluc produces a localized color, making it useful in identifying GUS gene presence. X-Gluc has reported applications in the detection of contaminated food samples such as meat, dairy, and shellfish products. The ColonyDoc-It Imaging Station (Figure 1) has the ability to differentiate between  $\beta$ -glucuronidase positive (blue) bacteria and negative (yellow) bacteria. Figure 2 shows a sample of multicolor colonies captured with the ColonyDoc-It Station.



## Metrology

The metrology laboratory was equipped with several new items concerning the temperature calibration which include a Secondary Reference PRT with a great precision over a wide temperature range connected to a Fluke Calibration 1502A Thermometer Readout unit. The sensor for this probe is a reference-grade platinum and feature four-wire connection with less noisy measurements than two-wire counterpart.



In addition to a new 5649 Type R Thermocouple Standard is made from the finest platinum and platinum-rhodium alloy which covers a temperature range of 0 °C to 1450 °C with uncertainties as good as 0.15 °C over most of that range.

Finally the lab was also equipped with most of the accessories to complete the system of its primary temperature reference, the triple point of water. These accessories include the 7312 Triple Point of Water Maintenance Bath that keeps the cells up and running reliably for weeks at a time even during heavy usage, in addition to the Fluke Immersion Freezer 2031A and the Dewar Ice Bath Fluke 2028.

## Physical Chemistry

An additional HPLC system equipped with:

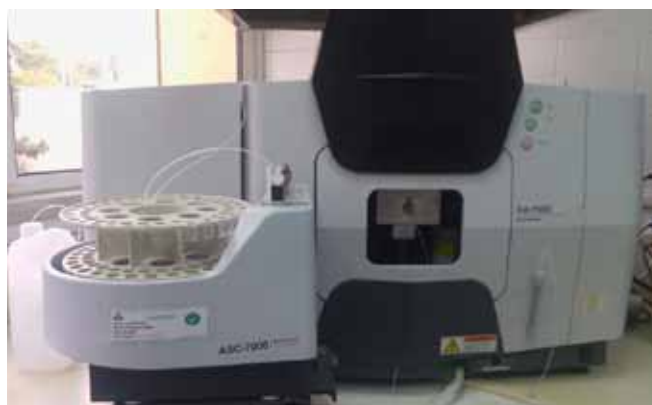
- A Refractive index detector for the analysis of sugars and sugar alcohols
- A Fluorescence detector for the analysis of Aflatoxins B1, B2, G1, G2, Aflatoxin M1, Ochratoxin A, and Benzo(a)pyrene

A nitrogen evaporator for the evaporation of heat-sensitive samples during analysis.



## Wet Chemistry

An additional Atomic Absorption Spectrophotometric system for the analysis of elements.



4



International  
Accreditation

## Quality management overview

The quality management section personnel assisted by 40 trained auditors keep and maintain a sound quality management system in accordance with ISO 17025 & ISO 17020 requirements.

With 1000 controlled documents, 30 Key Performance Indicators continuously monitored, 500 man-days audits and assessments performed, the competence of IRI was recognized from the most rigorous accreditation bodies in the world (successively DAP, DACH, DAKKS, ACLASS and currently ANAB).

In addition, IRI regularly participates in international proficiency testing rounds to validate its results. Until date, 2000 tests were done for 1300 parameters with a successful ratio of 97%.

This robust quality management system enabled the Industrial Research Institute to become accredited to ISO 17025 (since 2004) & ISO 17020 (since 2017). This helped the Institute to be a key player in the National Quality Infrastructure and earn the confidence of the most prestigious national and international organizations thus enhancing its network of partnership.

Details of the scopes of accreditations are available on the website: [www.iri.org.lb](http://www.iri.org.lb) accreditation section.

The scope of accreditation to ISO 17020 covers the inspection of imported goods subject to National decrees, inspection of goods for export as well as inspections according to customers' specific requirements. This quantitative and/or qualitative inspection covers the following fields:

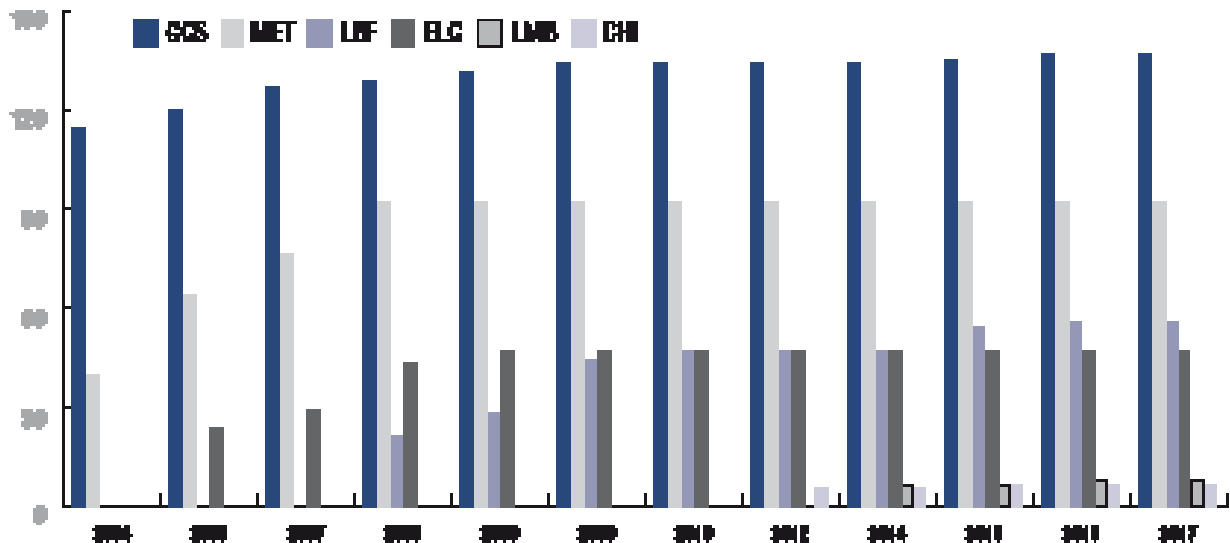
- Electrical Appliances
- Ceramic Tiles
- Sanitary Wares
- Medical Items
- Food
- Cosmetics
- Petroleum products
- Glass
- Diapers
- Workbook



The scope of accreditation to ISO 17025 covers more than 350 tests methods in different fields as detailed below:

- *Chemical, physico-chemical and microbiological* testing of food and animal feeding stuff, vegetable oils, water for human consumption & waste water, cosmetics, wet wipes & baby diapers,
- *Electrical* testing of household appliances, electrical products, luminaires, lamps & lead acid batteries, circuit breakers,
- *Physico-chemical and rheological* testing of grain, flour, cereals, pulses, feed, milled products & by products in bulk and sacs,
- *Mechanical calibration* of conventional masses (class E2 & lower) and balances (on site & in permanent laboratories),
- *Physico-mechanical* testing of cement and ceramic tiles.

	2004	2005	2007	2008	2009	2010	2012	2014	2015	2016	2017
CHI	114	120	127	129	131	134	134	134	135	137	137
LMB	40	64	76	92	92	92	92	92	92	92	92
ELC				21	28	44	47	47	54	56	56
LBF		24	29	43	47	47	47	47	47	47	47
MET								6	8	8	8
GCS							5	5	6	6	6
<b>TOTAL</b>	<b>154</b>	<b>208</b>	<b>232</b>	<b>285</b>	<b>298</b>	<b>317</b>	<b>325</b>	<b>336</b>	<b>347</b>	<b>351</b>	<b>351</b>





# CERTIFICATE OF ACCREDITATION

**ANSI-ASQ National Accreditation Board**  
 500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

## Industrial Research Institute

**Lebanese University Campus, IRI Building, Hadath (Baabda)  
 Beirut, Lebanon 11-2806**

has been assessed by ANAB  
 and meets the requirements of international standard

## ISO/IEC 17020:2012

while demonstrating technical competence in the field of

## INSPECTION

Refer to the accompanying Scope of Accreditation for information regarding the types of inspections to which this accreditation applies.

AI-2499  
 Certificate Number



ANAB Approval

Certificate Valid: 08/31/2017-11/03/2019  
 Version No. 001 Issued: 08/31/2017



This inspection body is accredited in accordance with the recognized International Standard ISO/IEC 17020:2012. An inspection body's fulfillment of the requirements of ISO/IEC 17020:2012 means the inspection body meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid inspection results (refer to joint ISO-ILAC-IAF Communiqué dated Sept 2013)



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and meets the requirements of international standard

## ISO/IEC 17025:2005

while demonstrating technical competence in the fields of

## CALIBRATION AND TESTING

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations and/or tests to which this accreditation applies.

ACT-1898

Certificate Number



ANAB Approval

Certificate Valid: 12/09/2016-11/03/2018

Version No. 002 Issued: 12/09/2016



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAP Communiqué dated January 2009).

5



Internal & External  
Activities

## The Administrative and Financial Director, Mr. Salim Kfoury Represents IRI in First Working Group Meeting to Link Academia with Industry in Arab countries

Rabat, 24-25/04/2017

The Arab Industrial Development and Mining Organization (AIDMO) held the first meeting of the working group for linking academia with industry in Arab countries, on 24-25/04/2017 in the Moroccan capital, Rabat. The meeting was attended by 40 representatives of 22 institutions and organizations from several Arab States (Jordan, Bahrain, Tunisia, Algeria, Sudan, Lebanon, Libya, Egypt and Morocco). International organizations also participated in the meeting, including the Islamic Educational, Scientific and Cultural Organization (ISESCO), the ESCWA Technology Center (ETC), the Federation of Arab Scientific Research Councils (FASRC), the Center for Mediterranean Integration (CMI), the European Investment Bank (EIB) and AIDMO's delegation.

Lebanon's Industrial Research Institute was represented by its Administrative Director Salim Kfoury. In his opening speech, AIDMO's Director General, Eng. Adel Al-Saqer, praised the role played by the Kingdom of Morocco in supporting the joint Arab action and the different institutions. He welcomed the audience and explained that the meeting aims at developing an Arab program to link the scientific research and technological development institutions with the industry sector, as well as promoting the innovation. He highlighted the importance of industrial innovation in order to achieve the added-value and create job opportunities.

Pr. Abdelillah Benyoussef, the Director of MAScIR's nanomaterials center in Morocco, was nominated as Chairperson of the meeting, while Mr. Saleh Aljaghdaif, Director of Research and Development in AIDMO, was designated as the rapporteur of the meeting. The Drafting Committee included: Dr. Widad Abdel Halim, Director General of Sudan's Industrial Research and Consultancy Centre (IRCC); Dr. Adel Abdel Moneim Nawfal, a full professor in metal foundry at Egypt's Central Metallurgical Research Institute (CMRDI); Dr. Youssef Abdallat, Faculty For Factory (FFF) program Director at the University of Jordan; Dr. Ayad Jalloul, the Head of Private Sector in AIDMO's R&D Department and Aicha Chlouah from AIDMO's R&D Department.

The participants discussed the following topics:

- 1- AIDMO's efforts towards developing an Arab program to link academia with industry.
- 2- Establishing national offices to transfer technology in Arab countries / ESCWA.
- 3- Tunisia's experience in linking academia with industry.
- 4- Sudan's experience in linking the scientific research institutions with the industry sector.
- 5- Promoting partnership between academia and industry to achieve economic developments / ISESCO.
- 6- Morocco's experience in linking academia with industry and promoting innovation / Ministry of Higher Education, Scientific Research and Professional Training.
- 7- Scientific research and innovation in nano fields. Methods to narrow the technological gap between the Arab countries and the developed countries / MAScIR institution.

- 8- Bahrain's experience in linking academia with industry (building confidence and joint action).
- 9- Roadmap to creativity and innovation in Arab countries / AIDMO.
- 10- Relation between the research system and the production system in Tunisia, and the prospects for Arab cooperation in linking academia with industry in Tunisia.
- 11- The scientific research, the technological evolution and their role in promoting innovation and achieving industrial development in Arab countries / Algeria.
- 12- Jordan's experience with its national program for linking industry with academia, the Faculty For Factory (FFF) program, and promoting the culture of entrepreneurship and innovation / Jordan.
- 13- Linking academia with industry; elements of the Moroccan experience / Moroccan Ministry of Industry, Commerce, Investment and Digital Economy.
- 14- The Central Metallurgical Research Institute's role in enhancing the local metallurgical and mining industries in Egypt.
- 15- Mechanisms of linking industry with universities and scientific research institutes, and the experience of Libya's Industrial Research Center.
- 16- The importance of knowledge-based economy, and the role played by the offices of technology transfer and marketing and innovation support in linking the scientific research outcomes with economic activities in Egypt.
- 17- Morocco's experience with Electronics and Mechatronics.
- 18- The Agency for the Promotion of Industry and Innovation's role in linking the scientific research with industry in Tunisia.
- 19- Production of biofuels and biomaterials from algae. An Egyptian experience to link academia with industry.
- 20- Requirements to narrow the technological gap between the Arab countries and the developed countries / Arab Industrial Development and Mining Organization (AIDMO).
- 21- Creating the chart of the innovation indicators for the MENA region / Center for Mediterranean Integration (CMI).
- 22- The role of Morocco's National Center for Scientific and Technical Research (CNRST) in linking the academic research with industry and promoting innovation.
- 23- The role of the Federation of Arab Scientific Research Councils (FASRC) in linking the academic and research institutions with industry through the scientific links experience.
- 24- The experience of Morocco's entrepreneurs agency.
- 25- A presentation on Lebanon's Industrial Research Institute.
- 26- Concerted efforts to link academia with industry, in order to create an Arab working group to link academia with industry / Arab Industrial Development and Mining Organization (AIDMO).

The meeting concluded its work with a roundtable endorsing the following recommendations:

***I - General Recommendations:***

- 1- To establish a permanent Arab core working group (open-ended) composed of the meeting participants, with their names, titles and their organizations. This group will be named "Arab

Working Group to Link Academia with Industry and Promote Innovation”, and it shall operate within AIDMO’s scope.

- 2- The concept paper shall revolve around the objectives, missions and modus operandi of the Arab working group for linking academia with industry and promoting innovation.

## ***II - Recommendations to Members of Arab Working Group Linking Academia with Industry and Promoting Innovation***

- 1- Members of the Arab working group who are participating in the meeting shall review the electronically distributed roadmap document for creativity and innovation in the Arab countries. They shall also submit their observations and views regarding this document within two months (30 June 2017), in order to develop it. In addition, priority projects for the roadmap executive program were also suggested.
- 2- Members of the Arab working group, dedicated to link academia with industry and promote innovation, shall actively participate in the “Arab Conference for Creativity, Innovation and Competitiveness” (Beirut: first quarter 2018), organized by AIDMO in partnership with ISESCO, ESCWA, CMI and other organizations.

## ***III - Recommendations to AIDMO:***

- 1- AIDMO shall revise the “Roadmap to Creativity and Innovation in Arab Countries” document, after taking into account the observations and views, concerning the roadmap, by the Arab working group for linking academia with industry. It shall be finalized and submitted for approval in the workshop scheduled to be held (16-18/12/2017 in Kuwait) with the participation of the working group’s members.
- 2- AIDMO, jointly with Arab and regional organizations (ISESCO, ESCWA, FASRC,...), shall call for the organization of an Arab innovation exhibition, to choose the best scientific research providing solutions to an industrial institution in every Arab country, in order to promote the research outcomes.
- 3- AIDMO shall build an information platform for the activities and missions of the Arab working team for linking academia with industry and promoting innovation, including an interactive database, as well as other specialized databases and entries.
- 4- AIDMO shall follow up on the current efforts regarding the preparation of indicators to measure the National System for Science, Technology and Innovation in Arab Countries, taking into consideration the inputs, outputs and consequences, in order to capitalize on them and benefit from the experiences of existing national observatories.
- 5- AIDMO shall enhance the access of the Arab industrial sector to patents and strengthen the Arab coordination concerning the patents.
- 6- AIDMO shall call on the private sector, represented by the General Union of Chambers of Commerce, Industry & Agriculture of the Arab Countries (private companies), and the Association of Arab Universities, to join the working group and participate in its meetings.

## ***IV - Recommendations to Arab Countries:***

- 1- Arab countries shall develop national programs including practical steps to link industry with



research institutions and to activate the system of modernization, innovation and transfer of technology at the institutional level, in addition to linking it with the national system of every country to obtain an Arab network for the transfer of technology, and spreading the successful experiences.

- 2- The Arab countries shall develop and activate special legislations on scientific research and innovation, in order to serve the industry and promote it, and give special benefits to the outcomes of scientific research and innovation, as well as enhancing partnership between the public and private sectors.
- 3- To develop partnerships between the youth innovation organizations in Arab countries, based on the increase of work, creativity and innovation.
- 4- The Arab countries shall develop national technological poles to embrace creators, innovators and national experiences, and to become educational and training centers for youths.
- 5- To build relationships and partnerships with big industries in Arab countries, and mutually benefit in the areas of scientific research and the promotion of innovation.
- 6- To call on Arab countries to activate national funds to help link academia with industry. These funds will be financed by industrial institutions, which will benefit in turn from applied solutions that will resolve their problems, improve their products and bolster their competitiveness.
- 7- To thank AIDMO for its initiative in organizing this important meeting and providing with all the necessary facilities for its success.

## The IRI Technology & Development Director Dr. Imad Hage Chehade Lectures in Saida on Renewables and Their Potential

The Lebanese University Institute of Technology organized, at its Saida branch, a seminar where Dr. Imad Hage Chehade, IRI's Technology and Development Director, lectured on the applications of renewable energy in general, and solar energy in particular, in the institute's buildings. He also described the different energy-saving steps taken by using high energy-efficient equipment that helped the IRI achieve significant financial savings.

With this technology used since 2012, the Industrial Research Institute was leading by example. Hence, Lebanese plants benefitted

from the information and standards available at the institute to implement similar projects that helped lower their production costs.



## Workshop on Effective Application of Measurement Law No 158 at the Ministry of Economy

In the context of finalizing the 'implementing decrees and decisions' mentioned in the Measurement Law No 158/2010, the Ministry of Economy and Trade organized a workshop on the effective application of the provisions of this law, as part of other legislations that were approved in the Parliament and became applicable pending the issue of many 'implementing decisions and decrees'.

Dr. Imad Hage Chehade, IRI's Technology and Development Director and a member of the National Council Metrology, gave lectures in this workshop. He explained the metrology functions in the industrial institutions and IRI's role in carrying out some of the tasks mentioned in the Law No 158, particularly its role as a national institute for measurement possessing the necessary technologies that made it a national and regional benchmark in terms of metrology.

## IRI and German PTB Organize a Regional Workshop on Legal, Scientific and Industrial Calibration

The Industrial Research Institute and the German federal institute Physikalisch-Technische Bundesanstalt (PTB) organized a regional workshop on legal, scientific and industrial calibration. It was attended by experts and officials from the Ministry of Economy and Trade, the IRI, the PTB and other stakeholders from Egypt, Palestine and Jordan, as part of a cooperation and technical support project between IRI and PTB.

From Lebanon, Dr. Imad Hage Chehade and Eng. Elias Maalouf participated in the workshop representing the IRI as a regulating national measurement institute in the field of scientific and



industrial metrology. Eng. Tarek Younes represented the Consumer Protection Directorate in the Ministry of Economy and Trade, which is the official regulator of legal metrology in Lebanon. The participants discussed how to enhance existing cooperation, promote the exchange of expertise, training and knowledge, and develop a future vision for a joint action during the next three years. As a result, new services related to the calibration of volumes will be launched in the institute, and some current services will be developed by trying to provide them with an international accreditation, which will complement the existing international accreditation.

### Training Sessions on Internal Audit and ISO 9001 Standard

Amid its continuous capacity-building efforts and search for the latest developments in standardization and audits, the Industrial Research Institute, jointly with its European partner Fréa, organized training sessions on the newest version of the international standard ISO 9001 released in 2015, and on the internal audit of the quality management systems according to the updated standard. Representatives of many Lebanese institutions also participated in these sessions.

### LSES honors IRI's Director General and Technology & Development Director

The Lebanese Solar Energy Society (LSES) honored IRI's Director General Dr. Bassam Frenn, as well as the Technology and Development Director Dr. Imad Hage Chehade, by granting them plaques of recognition and appreciation for the joint efforts between the Society and the Institute. LSES and IRI had several joint activities since many years, notably the organization of conferences and workshops on energy issues, raising awareness on renewables and energy-efficiency through the Ecotruck vehicle, which is visiting Lebanese schools to introduce students to renewable energy, its applications and energy efficiency.



## Workshop on Metrology in Lebanon Organized by the Ministry of Economy and Trade 29/11/2017

Dr. Imad Hage Chehade, the Technology and Development Director and IRI's representative at the National Council for Metrology, participated in a workshop on metrology in Lebanon: General Policy and Culture. This workshop is part of the "Building the Rule of Law Society: Promote Good Governance and Law" program, which is implemented by the Lebanese Foundation for Permanent Civil Peace (LFPCP) and the Ministry of Economy and Trade, with the support of the United States Agency for International Development (USAID).



This program aims at helping enforce some laws, which were already approved but are waiting for legal provisions of decrees and decisions to fully enter into force. Among them is the Law No 158 that was adopted in August 2011, and under which was established the National Metrology Council. Some implementing decrees were already prepared and are waiting for Cabinet approval. Dr. Chehade gave two lectures, the first on the metrology role in the industrial institutions, and the second on the metrology laboratories in Lebanon. As part of the workshop recommendations, he emphasized the necessity of establishing a general policy for metrology in Lebanon, and seeking to issue 'implementing decrees and decisions' for the Law No 158. In addition, the Lebanese State should do the global networking by joining international agreements, particularly the Metre Convention and the global metrology system. Dr. Chehade stressed the importance of activating some Lebanese institutions such as the Lebanese Accreditation Council (COLIBAC), which was already approved under Law No 572 in 2004, but is still inactive and limited to its Board of Directors.

## IRI Participates in the 8th Edition of International Beirut Energy Forum

As usual, the Industrial Research Institute took part in the eighth edition of the International Beirut Energy Forum. It had several activities and a continuous presence in a permanent stand displaying IRI's general services and some of the energy activities carried out by the institute.

Moreover, Dr. Imad Hage Chehade lectured during the forum on IRI's energy activities, namely the solar power production at the institute, the awareness raising through the Ecotruck vehicle, the energy laboratory and the training platform on the solar cells technology, among others.





## Training Sessions on Energy Management System ISO 50001 Standard

May 18-19, 2017

For the second consecutive year, the International Organization for Standardization (ISO) and the Lebanese Standards Institution (LIBNOR) organized a training session on the Energy Management System ISO 50001 standard. More than 25 industrial institutions participated in this two-day training session.

This session is part of the MENA STAR project. Through his lectures, IRI's Technology and Development Director Dr. Imad Hage Chehade took part in this session as an energy expert accredited by the ISO for this project. He explained in several lectures the content of this ISO standard, and how to apply it in the industrial institutions, stressing the mechanism for obtaining the ISO 50001 certification.



## Activating a MoU for Mutual Recognition between Lebanon and Egypt

In order to actively implement a Memorandum of Understanding regarding the mutual recognition of conformity certificates between Lebanon's Industrial Research Institute and the Egyptian Organization for Standards and Quality (EOS), an IRI delegation composed of Dr. Imad Hage Chehade and Mr. Jerji El Khoury visited Cairo and held meetings with the authorities responsible for the control of imported goods in Egypt. Both parties agreed on implementing an agenda with clear steps to be taken by each party. The agreement aims to activate the Memorandum of Understanding as fast as possible, and to determine clear lists of goods exchanged between the two countries.



## IRI Participates in a Workshop on "Sustainable Development" and "Green and Inclusive Economy"

At the invitation of the Moroccan standardization institute IMANOR, and in partnership with the International Organization for



Standardization (ISO), the Industrial Research Institute was represented by its Technology and Development Director, Dr. Imad Hage Chehade, at a regional workshop on “Sustainable Development” and “Green and Inclusive Economy”. The event, which was part of the MENA STAR project, was held on 10 and 11 July 2017 and attended by delegations from several Arab countries from the Middle East and North Africa region, including Morocco, Algeria, Tunisia, Egypt, Jordan and Palestine, as

well as experts from ISO and Germany’s Physikalisch-Technische Bundesanstalt (PTB) institute. The participants presented the national activities destined to promote the concept of green and inclusive economy. Dr. Chehade also presented IRI’s numerous activities in this field, and a national roadmap was suggested to be implemented in order to raise awareness in this area.

## IRI’s Technology and Development Director Dr. Imad Hage Chehade Participates in Ecomondo and Key Energy Events - Italy

**Rimini Italy, November 7th to 10th 2017**

The priority commitments for the Green and Circular economy of the European Commission were the highlights of expo contents and events at Ecomondo and Key Energy.

Four days for sharing knowledge, technologies and strategies to ensure enterprises a leading role in the European scenario that aims at reducing the production of waste, and encouraging its re-use,



thanks also to important funding to support research and innovation.

Therefore, redesigning products and industrial processes, adopting the principles of the circular economy, is the issue for modern manufacturing, efficient green cities, remediation and upgrading of polluted sites and management of water resources. Ecomondo and Key Energy also presented real examples of companies, cities and institutions that have already adopted the principles of the circular economy.

The event organized by Italian Exhibition Group, being attended by 116,131 visitors (+10%), over 12,000 of whom were international.

Combining contents involved in regulations, research, innovation, and the creation of enterprises with a European and international profile, and wide participation at a trade expo is Ecomondo's characteristic feature.

This new scenario, connected with the commitments of the Paris Climate Agreement, will lead to a decisive growth of photovoltaic power, which could increase tenfold compared with recent years. Wind energy will also undergo a clear growth thanks to the new plants and the revamping of existing ones. In this new stage of ferment, the solar energy sector seems to have once more found its home at Rimini Expo Centre with Key Solar.

Dr Imad Hage Chéhade, Technology and Development Director at IRI, participates with a Lebanese delegation of 20 persons from energy Lebanese sector. The Expo was an occasion to make high necessary contact with potential suppliers and partners.



## Professor Joseph Matta, Laboratories Division Head Represents IRI in Various Activities

### Second “Entrepreneurial University” Symposium at USJ

Professor Joseph Matta participated in the 2nd Symposium of the “Entrepreneurial University”, which was held on 26 January 2017 at the Human Sciences Campus (CSH) of Saint Joseph University, in Beirut.

This event was organized by the Lebanese Association for the Advancement of Science (LAAS), in partnership with Saint Joseph University. It was also supported by the regional directorate of the Francophone University Association (AUF) in the Middle East, as part of its conferences cycle on the relationship between Universities and Entrepreneurship.

These meetings aimed at promoting the entrepreneurship culture among PhD students in Lebanon in order to encourage them to participate in the economic development of the country.

Professor Joseph Matta explained that the symposium’s theme was among IRI’s established targets to meet the needs of Lebanese companies and industrialists, by providing them with all necessary services required for their development. These services are particularly related to the applied research, conformity, quality, analytical tests and mandatory standards, not to mention the support in the environmental field.

He finally reminded of the commitment of the Industrial Research Institute’s Directorate General towards the success of the Entrepreneurial University and every project intended to serve the companies, the industries and the development.



## National Campaign to Support Lebanese-Made Pharmaceuticals

Professor Joseph MATTA represented the Industrial Research Institute, in the National Campaign to Support Lebanese-Made Pharmaceuticals, held at the Grand Serail on February 17, 2017. The campaign has been launched by the Syndicate of Pharmaceutical Industries in Lebanon (SPIL) under the patronage of the Lebanese Prime Minister H.E Mr. Saad Hariri, in partnership with the Lebanese Ministry of Public



Health (MOPH) and the Lebanese Ministry of Industry (MOI).

Professor MATTA emphasizes on maintaining close co-operation with official institutions and industrial organizations and mentions the studies conducted as well as the applied research performed at IRI in this field.

### Consumer Day Celebration at the Grand Serail on March 14th, 2017

Professor Joseph Matta, representing IRI's Director General Dr. Bassam Frenn, participated in the “Consumer Day” celebration held at the Grand Serail, under the patronage of the Lebanese Prime Minister HE Mr. Saad Hariri who was represented by the Minister of Economy and Trade Mr. Raed Khoury, on March 14, 2017.



This event comes against the backdrop of an international campaign for a “Better Digital World”, which is promoting the consumer’s communication, participation and innovation, as well as developing the economy and the society.

### Horeca Press Conference

Under the theme “From Lebanon to the World,” giving eminence to Lebanese flavors, the IRI represented by Professor Joseph MATTA, participated at a press conference held by Hospitality Services under the patronage of the Minister of Tourism, H.E. Mr. Avedis Guidanian, on March 23rd 2017 to launch the 24th edition of HORECA Lebanon, the annual meeting for the hospitality and foodservice industries.



### Bechara Al Khoury Prize for Democratic Awareness

Professor Joseph Matta represented IRI's Director General Dr. Bassam Frenn in the ceremony that was organized by the Ministry of Education and Higher Education (MEHE), the Spanish Embassy in Lebanon and the Committee of the Bechara El Khoury Prize for Democratic Awareness at the Lawyer's House (Beit Al Mouhami) in Beirut, on May 11th, 2017, to announce the results of the competition on the theme “Economic and Social Freedom and Democratic State Building”.

This project is intended to make a positive difference in the Lebanese society, primarily promoting the political education and raising the social awareness, as well as developing both of them among youths.

## Food Safety and Environmental Toxins and Current Challenges in Lebanon

Professor Joseph MATTA, represented Dr Bassam FRENNE, in the conference titled, “Food Safety and Environmental Toxins and Current Challenges in Lebanon” held at the Faculty of Nursing and Health Sciences (FNHS) at Notre Dame University-Louaize (NDU) and organized on May 22, 2017, under the patronage and in the presence of H.E. Minister of Environment Tariq al-Khatib. Professor Joseph MATTA addressed the subject from a scientific perspective and shared his information on the effects of fluoride and fluoridation as well as the applied research performed at IRI in this field.



Following the conference, a roundtable discussion, was held with H.E. former Minister of Interior and Municipalities Ziad Baroud who discussed the legal aspects as well as H.E. MP Dr. Atef Majdalani, H.E. MP Amal Bouzaid, and specialists in the field.

## Lebanon Climate Act

Professor Joseph MATTA, representing the IRI, took part of the first anniversary of “Lebanon Climate Act” celebration held at the Université Saint-Joseph on July 10, 2017, under the auspices of H.E. the Prime Minister Saad El Hariri.

This initiative is implemented by Green Mind Organization in cooperation with UNDP and in support of Banque Du Liban, the European Union and in coordination with the chamber of Commerce, Industry and Agriculture in Beirut.

This project aims tracking private sector actions in meeting Lebanon’s’ Intended Nationally Determined Contribution (INDC) officially submitted at the 21st Conference of the Parties (COP21). It was established to tackle climate change challenges while simultaneously increasing economic growth and generating a better value of life for future generations.

Professor Joseph MATTA discussed the importance of having both individual and collaborative effort toward achieving Lebanon’s set goals in reducing global warming.

## Agriculture and Land: Reality, Solutions and Prospects USEK Zahlé

Professor Joseph MATTA, participated in the agricultural development conference entitled: “Agriculture and Land: Reality, Solutions and Prospects”, organized under the high patronage of His Excellency General Michel Aoun, President of the Republic of Lebanon, the Holy Spirit University of Kaslik (USEK) and Lebanon’s Ministry of Agriculture, that took place at USEK’s Faculty of Agricultural and Food Sciences of





Zahlé on October 27, 2017.

Professor Joseph Matta described the IRI applied research and activities in this field and the conference allowed the scientific institutions representatives to exchange among each other on the progress they made in the agricultural field.

### CNRS and USJ Honor Winners of Research Excellence Awards

On November 24th, 2017, the National Council for Scientific Research (CNRS) and Saint Joseph University (USJ) celebrated at the university campus the success of the scientific researchers who were granted Research Excellence Awards, including Professor Joseph Matta, the Head of Laboratories Division at the Industrial Research Institute.

These researches reflected the importance of cooperation between the CNRS, the USJ and the IRI in knowledge production and the promotion of applied scientific researches to support innovation and excellence, as well as the scientific quality, which is one of IRI's top priorities.



### National Awareness-Raising Seminar and Workshop ISO MENA STAR

As a national expert for the Environment ISO MENA STAR project, Professor Joseph MATTA participated actively in the preparation and the delivery of the National Awareness-Raising Seminar and workshop on 27 and 28-29 November 2017. This ISO project aims to strengthen institutional infrastructure on standards and regulations to support business and industry in Middle East and North Africa (MENA STAR).

The main objective of the National Seminar and workshop was to promote Environmental Management System according to ISO 14001:2015 and to implement the Life-Cycle-Assessment according to ISO 14040 and ISO 14044. The main focus is to reach a baseline interest of participants in the Life cycle assessment methodology, as a tool for developing better products that fulfil better environmental requirements.



## New Water Treatment Technologies Adapted to Southern Countries - Lebanese University

The Industrial Research Institute, represented by Professor Joseph MATTA, participated in the National conference of New water treatment technologies adapted to southern countries, organized by the Faculty of Sciences of the Lebanese University and the UNESCO SIMEV Chair, with the support of AUF in the Middle East, that took place at the faculty of Sciences of the Lebanese University on 11 December 2017. The aim of this conference is to launch a national debate on the current state of water quality in Lebanon and to propose solutions in terms of membrane technologies adapted to the Lebanese situation.

Professor Joseph Matta described the IRI activities in the water field such as testing, quality control, as well as the specialized technological consulting services in the Treatment Techniques.

He mentions the studies conducted as well as the applied research performed at IRI in this field.



## LIRA 13 Forum of Technology and Industrial Innovation

Professor Joseph MATTA, representing Dr Bassam FRENN, participated in the LIRA 13 Forum of Technology and Industrial Innovation, under the auspices of President of the republic, General Michel Aoun, at Palace of Conventions, Dbayeh. The forum was held on 14 December 2017, in the topic of “Research & Innovation for Sustainable Industrial Development”.

The most debated topics concerned:

- The role of scientific research in economic development and the promotion of a culture of entrepreneurship among graduates and researchers
- Communication technology and its role in accelerating research and development
- The role of professional associations in the development of innovative applied research in industry
- The importance of transferring knowledge and technology from universities to the labor market
- Procedures of linking universities and research centers with the industrial sector
- Local and international success stories on the role of scientific research in industrial development

Professor Joseph MATTA, explained the strategic vision of IRI regarding the valorization of innovation and the transfer of technology which has been executed following three main axes:

- The planning and development of technical knowledge through different internationally accredited laboratories and specialized centers that provide support for industry and innovation





- The performance of the organizational system through the Quality approach and the certification of the system, the product and the personnel who are strategically important in terms of Lebanese production and the export to the international market.
- Interactions and scientific collaborations through the development of a network of national and international partners at the highest level.

### Delegations of University Students Visit IRI

Students delegations from Lebanese universities made field visits to IRI's laboratories to learn about their latest scientific developments, particularly the institute's competencies related to the environment, public health, petrochemicals, food safety, cosmetics, etc.



### Students from the Faculty of Engineering at the Lebanese University Attend an LWC Training Session

For the fifth consecutive year, the Lebanese Welding Center (LWC), which is affiliated to the Industrial Research Institute, organized a training session in Welding and Non-Destructive Testing for students from the Faculty of Engineering at the Lebanese University from 10/07/2017 to 18/08/2017, as part of an agreement between the IRI and the Faculty of Engineering.

The session was attended by 45 students, from the three branches of the Faculty of Engineering, and the Mechanical and Petrochemical majors. A specialized LWC team supervised the training and divided the participants into 6 groups. Each group of students attended two weeks of training. During the first week, they learnt theoretically all the welding methods, which enabled them to practically apply them using electrical welding methods manually. During the second week, the students attended extensive and detailed lectures informing them of the non-destructive tests, which are used on all kinds of welded materials, including the radiographic testing, the liquid penetrant testing, the magnetic particle inspection, the ultrasonic testing and the X-ray testing.



After that, the students were able to apply these tests on different welded materials and to find out their defects and flaws.

## Certificate of Appreciation to Eng. Amine Jbeily Sixth International Whole Grain Summit in Vienna Recommends More Whole Grain Intake

For over three decades, repeated studies have clearly demonstrated that people eating more whole grains have reduced risks of many diseases compared to those eating less. This has led many countries to adopt specific recommendations for people to choose whole grain-based foods instead of refined grain-based foods. Yet current data suggest that whole grain intake in most countries remains well below existing recommended levels, which is a concern for long-term public health.

To increase whole grain intake, efforts cannot be limited to one or two stakeholders, and must be addressed using the combined efforts of all parties involved in the food supply chain. For this reason, renowned experts and leading stakeholders, came together at the 6th International Whole Grain Summit, 13-15 November 2017 in Vienna, Austria, with the common goal of creating a collective action plan to increase whole grain intake worldwide, for the health and well-being of all people.

The Whole Grain Summit 2017 in Vienna brought together some 220 public health experts and PR managers, manufacturers and marketers, grain scientists and government regulators from 36 countries from all continents aiming at coming to consensus and measurable results on how to increase consumption of whole grains. Eng. Amine Jbeily, Head of the Central Laboratory for grains, flour and bread research and Technical



Director of ICC, was among the experts present at the Summit.

Adjacent to the Whole Grain Summit in Vienna, the members of the ICC Technical Committee convened under the chairmanship of ICC's Technical Director at the ICC Headquarters to discuss current validation projects and new working group activities.

During this event, ICC's CEO Michaela Pichler delivered a certificate of appreciation to Eng. Amine for all his efforts for re-launching vigorously the Standardization process since his election as Technical Director in 2016.

## ICC's Technical Director Amine Jbeily Visits Taiwan to Keep Abreast of the Latest Cereal Research Technologies

In the context of continuous technical cooperation, ICC's Technical Director Amine Jbeily visited Chinese Taipei-Taiwan by invitation from China Grain Products R&D Institute, Ministry of Foreign Affairs and the Council of Agriculture. In the aim of getting a closer and deeper perspective on the latest technologies in the cereal research and processing sectors.

During the 5 days Visit, Eng. Amine presented ICC's standardization activities and visited many prestigious Taiwanese governmental and research institute such as the:

- China Grain Products R&D Institute,
- Ministry of Foreign Affairs,
- Food Agency, Council of Agriculture,
- Taiwan Agriculture Research Institute,
- Department of Agronomy, National Taiwan University Graduate Institute of Food Science and Technology, where the SSR rice varieties identification method was presented. This technology is an ongoing ICC standardization project.

As well as field visits to cereal farms and cereals processing factories:

- AGV Products Corporation,
- Hung Yang Foods Corp. for grain farming and processing,
- Golden crop corporation.



## IRI Takes Part in a Workshop on Proficiency Testing in Egypt

The Industrial Research Institute represented by the Quality Management Section Head, Eng. Robert Haddad participated in a regional workshop for Proficiency Testing (PT) held between September 25th and 28th, 2017 in the National Institute of Standards (NIS), Egypt.

17 participants representing eight countries participated in this workshop.

The following topics were discussed:

- Technical and management requirements of ISO 17043 Standard
- Uncertainty in PT
- PT protocol and scheme preparation
- Statistical methods as detailed in ISO 5725 and ISO 13528 standards
- Monitoring of Non-conformities in PT results



## IRI Participates in the 6th Annual SHAMCI Meeting in Tunisia

The Industrial Research Institute represented by the Quality Management Section Head, Eng. Robert Haddad and the Renewable Energy Laboratory Head, Eng. Mohammed Hajjar participated in the 6th annual meeting of the Solar Heating Arab Mark and Certification Initiative (SHAMCI) network held on December 7th and 8th, 2017 in Tunisia.

This meeting was organized by the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) in collaboration with the National Tunisian Agency for Energy Management (ANME) and the Technical Center for Building Materials, Ceramics and Glass (CTMCCV).

The meeting was attended by more than 30 members representing certification and standardization bodies, testing facilities, energy ministries and agencies, as well as manufacturers and experts in the field of solar thermal energy and quality from Tunisia, Algeria, Morocco, Egypt, Jordan and Lebanon.

The objectives of this meeting were:

- To discuss the implementation of SHAMCI program at the National level in the Arab countries
- To address legal, financial and operational matters regarding the cooperation agreements between SHAMCI Secretariat and the National involved bodies

During this meeting a new SHAMCI network president for the following 3 years was elected and two technical committees were defined, one for the laboratories and the other for the inspection and certification bodies.



## Eng. Elias Maalouf, Head of Metrology Laboratory Represents IRI in ARAMET's Fifth General Assembly

The Industrial Research Institute was represented by its Head of Metrology Laboratory, Eng. Elias Maalouf, in the fifth general assembly of the Arab Program for Scientific and Industrial Metrology (ARAMET), and the tenth meeting of the Advisory Committee on Metrology, between 1 and 2 November 2017, at the headquarters of the Saudi Standards, Metrology and Quality Organization, in Saudi Arabia's capital Riyadh.



The meetings were attended by representatives of national metrology institutes from Lebanon, Saudi Arabia, Sudan, Egypt, Morocco, Mauritania, Kuwait and Yemen (represented by Eng. Maalouf with its authorization).

During the general assembly, the participants discussed the 2017-2018 program action plan, which primarily aims at joining the International Bureau of Weights and Measures (BIPM).

In addition, membership of representatives in action group was confirmed during the meeting, and technical committees were formed in the area of mass and temperature calibration.

## 3rd International Conference on Electrical and Electronic Engineering

Eng. Fady Y. MELLHEM, Electrical Laboratory Unit Head (Technology & Development Directorate), participated in the 3rd International Conference on Electrical and Electronic Engineering, Telecommunication Engineering and Mechatronics (EEETEM2017) that took place in Faculty of Engineering, Lebanese University, Campus of Hadath, Beirut, Lebanon on April 26-28, 2017. He presented his new scientific research paper in the fields of energy management and electrical smart grid titled "Thermal and Electrical Load Management in Smart Home Based on Demand Response and Renewable Energy Resources" that will be published by IEEE.

This research presents a robustness mathematical optimization model for a residential consumer in a smart grid environment. Scheduling and determination of operation for different type of thermal and electrical appliances are obtained as



well as the coordination and management between considered energy production systems. Also, the scheduling of the charging and discharging mode of electric vehicles and the battery storage system is presented. By implementing this algorithm in different case studies, the best minimization of the day-ahead energy cost is obtained by taking into consideration of some desired appliances temperature predefined by the customer to maintain a minimum comfort level.



## Optimal Residential Load Scheduling Model in Smart Grid Environment

Eng. Fady Y. MELLHEM, Electrical Laboratory Unit Head (Technology & Development Directorate), prepared a research paper in the fields of optimization and energy management titled “Optimal Residential Load Scheduling Model in Smart Grid Environment”. This paper has been presented in the 2017 17th IEEE International Conference on Environment and Electrical Engineering (IEEE EEEIC17) from 06-09 June at Congress Center le Stelline, Milan, Italy.



And it was published by the Institute of Electrical and Electronics Engineers (IEEE).

In this paper, an optimal residential load scheduling model is proposed by using the mixed integer linear programming. The proposed model presents an integration of renewable energy production, battery storage system with penetration of electric vehicles. It aims the scheduling of the production of generation systems and the operation time of electrical home appliances and electric vehicles, as a target to minimize the electricity bill of the residential consumer. Different scenarios with various grouping of production and consumption systems have been presented to prove and confirm the efficacy of the proposed technique and to find the optimal solution.

## Metrological Requirements: Workshop and Experience Sharing Mr. Imad Kahil Represents IRI in Jordan

In the Jordanian capital Amman, the Head of Customs Files Study Unit, Mr. Imad Kahil, participated in a workshop organized by the German federal institute of metrology Physikalisch-Technische Bundesanstalt (PTB) and the Jordan Standards and Metrology Organization (JSMO), with the participation of Egypt, Palestine, Jordan and Lebanon. The workshop was entitled “Metrological Requirements for Prepackages of the Quality Infrastructure Project in Support to Sustainable Economic Development and Trade Capacities of Arab Countries.”



During the training, field visits were conducted to different prepackaging centers, where the workshop topic was discussed, experiences were shared and PTB’s program in Germany was implemented. In addition, a field visit was organized to JSMO’s centers of metrological services.

Underscoring the fundamental concepts to determine the importance and the role of issuing and implementing resolutions related to metrology, was crucial for ensuring a higher level of consumer protection.

6



Applied Research  
& Studies

## The Institute performed 25 environmental and technological study and analyzes

The Industrial Research Institute keeps pace with the current status of industries and factories, especially the ones that received ISO environmental certification from the Institute, and ensures their continuous compliance with the scientific and technological standards required to maintain a healthy environment for human beings and preserve the nature.

The IRI completed 25 studies and analyzes in nineteen factories, among which studies in environmental auditing and in environmental analyzes and technical field studies, as follows:

### Comprehensive Environmental Analyzes and Technical Field Studies

- Cimenterie Nationale
- Holcim
- Sibline
- Sabeh Beton
- Unipack
- Hawa Chicken
- Solicar
- Algorithm
- Global Cosmetics
- Building Chemicals Company
- Nexans – Liban Cables
- Ultrix
- Omega Paint
- Chemipaint
- Royal Gourmet
- Domal
- Ahmad Al Dirani
- Lina Fadel Choughair
- Fenianos

7



Scientific Publications

The scientific research contributes to the progress and development of societies by securing better living conditions. Hence, the Industrial Research Institute had many contributions in this respect during 2017, and some of the findings resulting from IRI's researches appeared in international scientific publications, contributing to the progress of science and knowledge. Professor Joseph Matta, IRI's Laboratories Division Head, published many scientific researches on health, food and environment issues.



Environmental Science and Pollution Research

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## Serum concentrations of polychlorinated biphenyls (PCBs) in a Lebanese population: ENASB study

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Research Article

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### Abstract

Polychlorinated biphenyls (PCBs) are persistent organic pollutants that are still routinely detected 30 years after their restriction in many countries. PCBs have been associated with several non-communicable diseases. They are best measured via human biomonitoring (HBM). The concentrations of six indicator PCBs (PCBs 28, 52, 101, 138, 153, and 180) were measured in the serum samples of 316 Lebanese students and employees from Saint Joseph University of Beirut, Lebanon, using gas chromatography coupled to an iron trap mass spectrometer detector. PCBs were detected in 56.3 to 59.2% of the serum samples. The sum of PCB ( $\Sigma$ PCBs) levels ranged from <LOD to 338.84 ng/g lipids, with a geometric mean level of  $10.34 \pm 0.08$  ng/g lipids. The major contributor to the  $\Sigma$ PCBs was PCB 180. In the present study, the levels were, in general, lower than the values observed in several Western and European countries. No association was found between age and concentration of any of the PCBs. In terms of risk for health, the highest levels were lower than critical limits such as HBM I and II values. We observed an inverted U-shaped association between levels of serum PCBs and the risk of overweight/obesity (OR = 2.140; CI = 1.095–4.185;  $p = 0.026$ ). Regarding potential food contributors, we found no relation between PCB levels and fish consumption and a moderate relation with dairy product consumption (moderate consumers of dairy products had higher PCB levels compared to lower consumers) ( $16.92 \pm 0.1/6.92 \pm 0.12$ ;  $p = 0.025$ ). The present study is the first to provide information regarding PCB levels in a Lebanese population. Larger studies are required in order to estimate the PCB exposure parameters of the Lebanese population.

### Keywords

Human biomonitoring | Polychlorinated biphenyls | Persistent organic pollutants | Lebanon

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Journal of Clinical Densitometry

Available online 15 October 2017

In Press, Corrected Proof



Original Article

## Bone Geometric Properties of the Femoral Neck in Underweight Eumenorrheic Women

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Received 26 June 2017, Revised 1 September 2017, Accepted 7 September 2017, Available online 19 October 2017.

[Show link](#)<https://doi.org/10.1016/j.jocd.2017.09.002>[Get rights and content](#)

### Abstract

The aim of this study was to describe femoral neck (FN) geometry among eumenorrheic, underweight women around the age of peak bone mass. Proximal femur geometry and body composition were assessed in 12 underweight women and in 24 healthy controls using dual-energy X-ray absorptiometry. The Hip Structural Analysis program was used to determine bone geometry at the FN. The cross-sectional area (CSA) and the cross-sectional moment of inertia (CSMI) were significantly lower in underweight women than in controls ( $p < 0.05$ ). There was a trend toward lower sectional modulus ( $Z$ ) and strength index in underweight women ( $p = 0.15$ ). Body weight, body mass index, and lean mass (LM) were positively correlated with CSA, CSMI,  $Z$ , and neck-shaft angle ( $r = 0.428-0.611$ ,  $p < 0.05$ ). After controlling for body weight, body mass index, and LM, the differences in CSA, CSMI,  $Z$ , and neck-shaft angle were no more statistically significant between the 2 groups. The multivariate analysis retained LM as the main predictor of CSA, CSMI, and  $Z$  in the whole population. The present study suggests that thinness is associated with low resistance to axial forces (CSA) and bending load ( $Z$  and CSMI) in adult eumenorrheic women. LM seems to be a key determinant of FN geometry in underweight women.

### Key Words

Bone geometry; eumenorrhea; low body weight; peak bone mass





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— pp 1–11 | [Cite as](#)

## Serum concentrations of selected organochlorine pesticides in a Lebanese population and their associations to sociodemographic, anthropometric and dietary factors: ENASB study

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Environmental and human health issues related to pesticides: from usage and environmental fate to impact

First Online: 14 June 2017



Downloads

### Abstract

Organochlorine pesticides (OCPs) were banned by the Stockholm Convention many years ago; however, they are still detected in the environment due to their high persistence, their current illegal use, and their import from countries where they have not been banned. We evaluated the serum concentrations of selected OCPs (hexachlorobenzene (HCB),  $\beta$ -hexachlorocyclohexanes ( $\beta$ -HCH), *p,p'*-dichlorodiphenyltrichloroethane (DDT) and its metabolite *p,p'*-dichlorodiphenyldichloroethylene (DDE) in a sample of Lebanese adults using gas chromatography coupled to an ion trap mass spectrometer detector. The mean concentrations of HCB,  $\beta$ -HCH, DDT, and DDE were 7.4, 8.6, 2.1, and 18.9 ng/g of lipids, respectively, and the major contributor among the four OCPs was DDE. The OCP levels in the present study were in general lower than the values observed in several countries worldwide and their concentrations at the 95th percentile were lower than the biomonitoring equivalents (BEs) excluding any appreciable health risk. We observed an inverse association between HCB concentrations and body mass index (BMI) as well as HCB,  $\beta$ -HCH, and DDE levels, and smoking habits. Milk consumption however was positively associated with an increased serum level of  $\beta$ -HCH. This study, which was the first to investigate OCP serum levels in a Lebanese population, provides a baseline to which future measurements can be compared.

### Keywords

Human biomonitoring | Organochlorine pesticides | HCB |  $\beta$ -HCH | DDT | DDE | Lebanon

VOLUME 28 SUPPLEMENT 1 MARCH 2017

# OSTEOPOROSIS INTERNATIONAL

with other metabolic bone diseases

EDITOR-IN-CHIEF JOHN A. KANE AND FRANK COOPER

WCO-IOF-ESCEO  
World Congress on Osteoporosis, Osteoarthritis  
and Musculoskeletal Diseases  
23–26 March, 2017  
Florence, Italy

Osteoporosis

**PM**  
EFFECTS OF 12 MONTHS OF RESISTANCE TRAINING VS. ENDURANCE TRAINING ON BONE MINERAL DENSITY IN YOUNG OVERWEIGHT MEN  
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**Aim:** The aim of this study was to analyze the effects of two different training protocols on body composition, bone mineral content (BMC) and bone mineral density (BMD) in a group of young overweight men.

**Methods:** Forty-two young overweight men (body mass index  $\geq 25$  kg/m<sup>2</sup>) whose ages range from 18 to 32 years were randomly assigned to resistance training group (RTG), endurance training group (ETG), or a control group (CG). The experimental groups performed 160-minutes training for 12 months, three sessions per week. Weight, height, body composition (BMC, BMD), maximal strength and maximal aerobic velocity were measured before and after the training period.

**Results:** Both experimental groups (RTG and ETG) showed significant decrease in weight, body mass index (BMI), fat mass and fat mass percentage. RTG showed significant increases in maximal strength, maximal aerobic velocity, whole body BMC<sup>2</sup> and lumbar spine (L1-L4) BMC. ETG showed significant increases in maximal aerobic velocity and L1-L4 BMD but a significant decrease in whole body BMC. CG did not show any significant changes in these variables. RTG showed the highest improvements in bone variables and muscular strength.

**Conclusion:** In conclusion, the present study shows that resistance training is an effective method to decrease fat mass and to increase bone mineral density in young overweight men.

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Osteoporosis

**PM**  
VITAMIN D AND TRABECULAR BONE SCORE IN YOUNG LEBANESE ADULTS  
S. Alami, A. J. Bana, J. Bana, S. Fara, M. Bakhal, C. Mouton, H. Zerjal, B. D. Fige  
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**Aim:** To explore the relation between serum vitamin D and TBBS in a group of young Lebanese adults.

**Methods:** 51 young Lebanese men (22 normal weight, 29 overweight and 9 obese) and 61 young Lebanese women (27 normal weight and 34 overweight) whose ages range from 18 to 37 years participated in this study. Bone mineral content (BMC) and BMD were determined for each individual by DEXA at whole body (WB), lumbar spine (L1-L4) and hip (TH), and fatness of each (FM) (4L: Handlman, Madison, WI). Body composition and trabecular bone score (TBBS) was determined by DXA. Serum 25-hydroxyvitamin D level was measured by the Nucleon Advantage compact radio binding chemiluminescence immunoassay. Vitamin D deficiency was defined as a 25(OH)D concentration  $< 20$  ng/ml.

**Results:** In men  $< 25$  kg/m<sup>2</sup>, weight, BMI and fat mass were significantly correlated to TBBS ( $r=0.28$ ;  $p<0.01$ ,  $r=0.30$ ;  $p<0.01$  and  $r=0.21$ ;  $p<0.05$  respectively) while serum vitamin D level was positively correlated to TBBS ( $r=0.36$ ;  $p<0.01$ ). The positive association between TBBS and serum vitamin D remained significant after adjustment for BMI. Vitamin D sufficient men ( $n=22$ ) had a significantly higher WBBS ( $1.422 \pm 0.084$ ) vs.  $1.247 \pm 0.082$ ;  $p<0.05$ ) compared to vitamin D insufficient men ( $n=29$ ). In women ( $n=61$ ), weight, BMI and fat mass were not significantly correlated to TBBS while serum vitamin D level was positively correlated to TBBS ( $r=0.47$ ;  $p<0.001$ ). The positive association between TBBS and serum vitamin D remained significant after adjustment for TBBS. Vitamin D sufficient women ( $n=18$ ) had a significantly higher TBBS ( $1.4718 \pm 0.15$ ) vs.  $1.364 \pm 0.074$ ;  $p<0.01$ ) compared to vitamin D insufficient women ( $n=43$ ).

**Conclusion:** Our study suggests that serum vitamin D is a positive determinant of TBBS in young Lebanese adults. To our knowledge, this is the first study to find positive correlation between serum vitamin D and TBBS in young adults. Optimizing serum vitamin D levels may be associated with higher TBBS values in young adults. Our study provides an additional evidence of vitamin D as bone health.

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Osseoporosis Int

**P206**  
**DECREASED COMPOSITE INDEXES OF FEMORAL NECK BONEMINERAL DENSITY IN YOUNG OVERWEIGHT WOMEN**  
S. J. Barua<sup>1</sup>, A. Akbar<sup>2</sup>, M. Khatib<sup>3</sup>, I. Mann<sup>4</sup>, F. Feroz<sup>5</sup>, G. Mustafa<sup>6</sup>, S. Ahmad<sup>7</sup>

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**Aim:** To compare osteoporosis strength index (OSI), loading strength index (LSI) and impact strength index (ISI) among obese, overweight and normal-weight young women.

**Methods:** 37 young women (28 obese, 5 overweight) of normal weight whose age range from 18 to 25 years participated in this study. Three composites, namely OSI and LSI were determined for each individual by DEXA at whole body (WB), lumbar spine (L2-4), and hip (H1) and femoral neck (FN) (Hologic, Madison, WI). Body composition measures evaluated by DEXA. Composite indices of femoral neck strength (LSI, ISI and OSI) were calculated as previously described [1].

**Results:** WB BMD<sup>2</sup> and WB BMC<sup>2</sup> were significantly higher in obese women compared to normal-weight women ( $p < 0.001$ ). Lumbar spine BMD<sup>2</sup> was not significantly different among the three groups. T10 BMD<sup>2</sup> and FN BMD<sup>2</sup> were significantly higher in obese women compared to normal-weight women ( $p < 0.001$ ). LSI, ISI and OSI values were significantly lower in obese and overweight women compared to normal-weight women ( $p < 0.001$ ). In the whole population ( $n = 117$ ), BMI was negatively correlated to OSI ( $r = -0.48$ ;  $p < 0.001$ ), ISI ( $r = -0.30$ ;  $p < 0.001$ ) and LSI ( $r = -0.29$ ;  $p < 0.001$ ) but positively correlated to WB BMD<sup>2</sup> ( $r = 0.37$ ;  $p < 0.01$ ), WB BMC<sup>2</sup> ( $r = 0.35$ ;  $p < 0.001$ ), FN BMD<sup>2</sup> ( $r = 0.22$ ;  $p < 0.001$ ) and FN BMC<sup>2</sup> ( $r = 0.27$ ;  $p < 0.001$ ). Moreover, body weight was negatively correlated to OSI ( $r = -0.38$ ;  $p < 0.001$ ), ISI ( $r = -0.30$ ;  $p < 0.001$ ), FN BMD<sup>2</sup> ( $r = -0.29$ ;  $p < 0.001$ ) but positively correlated to WB BMD<sup>2</sup> ( $r = 0.41$ ), WB BMC<sup>2</sup> ( $r = 0.47$ ;  $p < 0.001$ ), FN BMD<sup>2</sup> ( $r = 0.26$ ;  $p < 0.001$ ) and FN BMC<sup>2</sup> ( $r = 0.27$ ;  $p < 0.001$ ). Finally, fat mass percentage was negatively correlated to LSI ( $r = -0.37$ ;  $p < 0.001$ ), ISI ( $r = -0.37$ ;  $p < 0.001$ ), FN BMD<sup>2</sup> ( $r = -0.29$ ;  $p < 0.001$ ) but positively correlated to WB BMD<sup>2</sup> ( $r = 0.38$ ;  $p < 0.001$ ).

**Conclusion:** This study suggests that obesity is associated with lower LSI, ISI and OSI values in young women. Implementing strategies to increase femoral neck strength indices in young obese women may be useful for preventing osteoporosis. Research fund is acknowledged.

**Reference:** Khatib M, Barua S, et al. Osteoporosis 2014; 17: 612.

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Osseoporosis Int

**P278**  
**FAT MASS IS A STRONGER DETERMINANT OF BONE MASS THAN SKELETAL MASS INDEX IN A GROUP OF YOUNG WOMEN**  
S. J. Barua<sup>1</sup>, A. Akbar<sup>2</sup>, N. Feroz<sup>3</sup>, G. Mustafa<sup>4</sup>, I. Mann<sup>5</sup>, F. Feroz<sup>6</sup>, S. Ahmad<sup>7</sup>, H. Zafar<sup>8</sup>, A. Akbar<sup>9</sup>, E. El Hage<sup>10</sup>

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**Aim:** The purpose of this study was to explore the relative importance of fat mass and skeletal mass index on bone mass index in a group of young women.

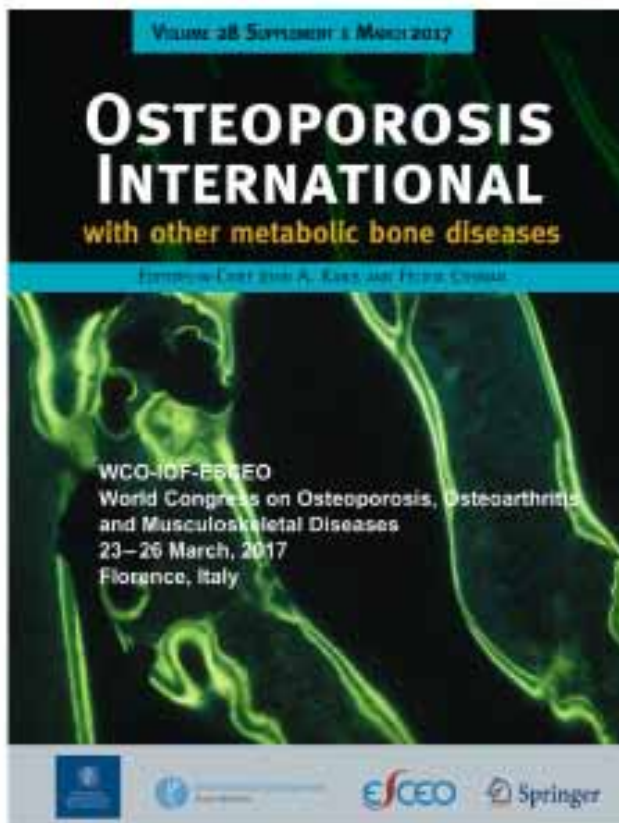
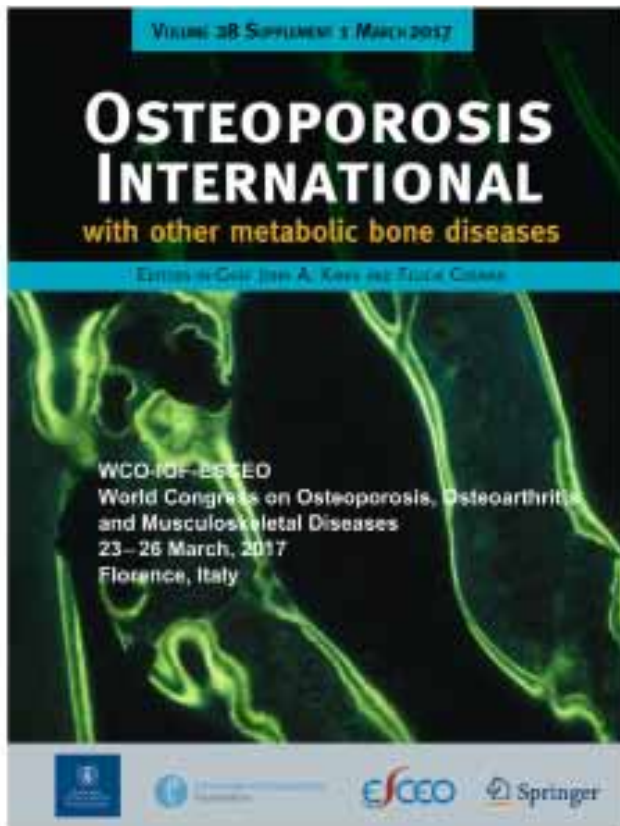
**Methods:** 50 young women (12 obese, 38 overweight) of normal weight whose age range between 18 and 32 years participated in this study. Weight and height were measured, and body mass index (BMI) was calculated. Body composition, bone mineral content (BMC) and bone mineral density (BMD) were measured by DEXA. Appendicular skeletal mass (ASM) in kg was calculated by summing the muscle masses of the four limbs, assuming that all non-fat and non-bone mass is skeletal muscle. BMI was defined as ASM/height<sup>2</sup>. Lumbar spine mineralized bone mass (LBM), femoral neck mineralized mass (FN BMD) and femoral neck cross-sectional moment of inertia (FN CSMI) were also measured by DEXA.

**Results:** fat mass was positively correlated to WB BMD<sup>2</sup> ( $r = 0.30$ ;  $p < 0.01$ ), WB BMC<sup>2</sup> ( $r = 0.29$ ;  $p < 0.01$ ), FN BMD<sup>2</sup> ( $r = 0.29$ ;  $p < 0.01$ ), FN CSMI ( $r = 0.47$ ;  $p < 0.001$ ) and FN CSMI ( $r = 0.46$ ;  $p < 0.001$ ). BMI was only correlated to WB BMD<sup>2</sup> ( $r = 0.39$ ;  $p < 0.001$ ), WB BMC<sup>2</sup> ( $r = 0.29$ ;  $p < 0.01$ ) and FN BMD<sup>2</sup> ( $r = 0.30$ ;  $p < 0.01$ ).

**Conclusion:** This study suggests that fat mass is a stronger determinant of bone mass and geometric indices of femoral neck strength than skeletal mass index in young women.

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Osteoporosis Int

**P596**  
**SKELETAL MUSCLE INDEX AND BONE VARIABLES IN A GROUP OF YOUNG OVERWEIGHT MEN**

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**Aim:** The purpose of this study was to explore the relationships between skeletal muscle index (SMI) and bone variables (bone mineral content, bone mineral density, geometric indices of hip bone strength and trabecular bone score) in a group of young overweight men.

**Methods:** Forty young overweight (BMI > 25 kg/m<sup>2</sup>) men whose ages range from 18 to 32 years participated in this study. Weight and height were measured, and body mass index (BMI) was calculated. Body composition, bone mineral content (BMC) and bone mineral density (BMD) were measured by DXA. Appendicular skeletal mass (ASM, in kg) was calculated by summing the muscle masses of the four limbs, assuming that all non-fat and non-bone mass is skeletal muscle. SMI was defined as ASM/height<sup>2</sup>. Lumbar spine trabecular bone score (TBS), femoral neck cross-sectional area (FN CSA) and femoral neck cross-sectional moment of inertia (FN CSMI) were also measured by DXA.

**Results:** SMI was positively correlated to whole body (WB) BMC (r=0.46; p<0.001), WB BMD (r=0.43; p<0.001), TBS (r=0.23; p<0.05), total hip (TH) BMC (r=0.34; p<0.001), FN BMD (r=0.37; p<0.001), FN CSA (r=0.46; p<0.001) and FN CSMI (r=0.39; p<0.001).

**Conclusion:** This study suggests that SMI is a positive determinant of bone strength parameters in young overweight men. Optimizing SMI in young overweight men may help to prevent osteoporosis later in life.

Osteoporosis Int

**P761**  
**RELATIONS BETWEEN MAXIMAL HALF SQUAT STRENGTH AND BONE VARIABLES IN A GROUP OF YOUNG OVERWEIGHT MEN**

 A. Khamis<sup>1</sup>, N. Ferra<sup>2</sup>, G. Mankor<sup>3</sup>, G. Mankor<sup>3</sup>, J. Marin<sup>4</sup>, E. Ferra<sup>5</sup>, H. Zouhal<sup>6</sup>, R. El Hage<sup>7</sup>
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**Aim:** The purpose of this study was to explore the relationships between maximal half squat strength and bone variables (BMC, BMD, hip geometric indices and TBS) in a group of young overweight men (BMI > 25 kg/m<sup>2</sup>).

**Materials and methods:** 50 Lebanese young overweight (BMI > 25 kg/m<sup>2</sup>) men whose ages range from 18 to 32 years participated in this study. Body composition and bone variables were measured by DXA. Maximal half squat strength was measured by 4 clinical fitness machines (each machine reporting the maximum of the national association of strength and conditioning and muscular strength (NCSA)).

**Results:** Maximal half squat strength was positively correlated to whole body BMC (r=0.37; p<0.001), whole body BMD (r=0.29; p<0.01), L1-L4 BMD (r=0.47; p<0.001), total hip BMC (r=0.28; p<0.02), femoral neck BMD (r=0.52; p<0.004), femoral neck cross-sectional area (r=0.48; p<0.001), femoral neck cross-sectional moment of inertia (r=0.27; p<0.05) and femoral neck areal bone mineral density (r=0.37; p<0.001). Strong multiple linear regression, positive correlations between maximal half squat strength and several bone variables measured include: whole body BMC, whole body BMD, L1-L4 BMD, femoral neck BMD, femoral neck cross-sectional area and femoral neck cross-sectional moment of inertia adjustment for total mass.

**Discussion:** These results highlight the positive influence of skeletal strength of the lower limbs on bone variables in young overweight men. The results have practical implications in the field of the prevention of osteoporosis in life.

**Conclusion:** This study suggests that maximal half squat strength is an independent determinant of bone mass, bone mineral density, and geometric indices of femoral neck in young overweight men.

Eng. Amine Jbeily, Head of IRI's Central Laboratory for grains, flour and bread research, contributed to the development of analysis methods benchmarking.

**The International Association for Cereal Science and Technology is the pre-eminent international association in the field of cereal and food science and technology, committed since its establishment to developing standard methods.**

Through collaboration with IRI, and international stake-holders, ICC developed in 2017 two key standard testing methods that deal with "global" emerging issues concerning Nutrition, human gut health and Whole Cereals bio-active compounds.

These newly published testing methods will serve as tools to promote healthy ingredients and to protect "consumers" through the control of "Health claims", "Adulteration", "Authenticity" and "fraud risks" related to the food chain.

The two methods can be shortly detailed as follows.

**ICC Standard I68: Measurement of Total Starch Content of Cereal Grains, Food and Feed Products using  $\alpha$ -Amylase/Amyloglucosidase Method.**

This method is for determination of the total starch content of cereal grains and a range of cereal food products based on the use of thermostable  $\alpha$ -amylase and amyloglucosidase.

Most starch assay procedures underestimate starch in samples containing resistant starch. This problem has become more pronounced with the introduction of high-amylose starches and the development of processing conditions which increase the levels of enzyme resistant starch.

Resistant starch (RS) — isn't fully absorbed in the small intestine. Instead, RS (Amylose) makes its way to the large intestine (colon), where intestinal bacteria ferment it into short-chain fatty acids (acetate, butyrate, and propionate) with unique health benefits.

**ICC Draft Standard No. 185: Measurement of Total Dietary Fibre in Cereals, Ingredients and Food Products Using the Rapid Integrated TDF Procedure (RINTDF)**

The definition for dietary fiber adopted by the Codex Alimentarius Commission (CAC) in June 2009 includes carbohydrate polymers that are not hydrolysed by the endogenous enzymes in the small intestine of humans and thus includes resistant starch (RS). This definition also includes oligosaccharides of degrees of polymerization (DP) of 3 to 9.

This "Standardized" testing technique is updated to quantify all types of dietary fibers identified recently and are now included in the definition of TDFs adopted by the Codex Alimentarius Commission (CAC) in 2009.

Megazyme-Ireland with the collaboration of ICC and IRI have developed a standardized method for the determination of total dietary fiber in foods and food ingredients as defined by the Codex Alimentarius Commission.

The method measures the complete range of dietary fiber components from RS to digestion-resistant oligosaccharides (SDFS). Reducing the incubation from 16 h to 4 h makes the assay more physiologically relevant, resulting in more accurate measurements.

Moreover, Eng. Fady Melhem, Electrical Laboratory Unit Head at IRI's Technology and Development Directorate prepared research papers in the field of energy and environment management.

**Optimization and Energy Management in Smart Home Considering Photovoltaic, Wind, and Battery Storage System With Integration of Electric Vehicles.**

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2017 IEEE Canadian Journal of Electrical and Computer Engineering (CJECE), DOI: 10.1109/CJECE.2017.2716780, Publication date: Aug. 2017, vol. 40, no. 2, Page(s): 128 - 138, IEEE PUBLICATIONS.

Abstract — With the emergence of smart grid, which presents the next generation of electrical power systems, residents have the opportunities to manage their home energy usage to reduce energy expenditure. This paper presents a mixed integer linear programming model to optimize the energy production and consumption systems in a smart home with the integration of renewable energy resources, battery storage systems, and gridable vehicles. Numerous case studies are presented by varying significant factors through the design of experiments with the Taguchi method. After that, a heuristic technique is proposed to solve the problem of residential energy management and to minimize the electricity cost of the consumer. Results find the global optimum solution for many consecutive days with important reduction of execution time and by achieving significant energy cost savings of the considered scenarios.

#### **Optimal Residential Load Scheduling Model in Smart Grid Environment.**

F.Y. MELHEM<sup>a,b</sup>, O. GRUNDER<sup>b</sup>, Z. HAMMOUDAN<sup>c</sup>, N. MOUBAYED<sup>d</sup>

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2017 17th IEEE International Conference on Environment and Electrical Engineering (EEEIC), DOI: 10.1109/EEEIC.2017.7977436, Publication date: Jul. 2017, Page(s): 1 - 6, IEEE PUBLICATIONS.

Abstract — The current power system has been basically intended to enable just centralized power generation and unidirectional power flow. In order to improve the conventional power grid to a smart grid, which is the next generation of electrical power systems, the consideration of decentralized generation and the demand side management is an essential stage. After the improvement in the residential area connection, the resident has the possibility to schedule his production and consumption systems by himself aiming to reduce the global electricity cost during the next day. In this paper, an optimal residential load scheduling model is proposed by using the mixed integer linear programming. The proposed model presents an integration of renewable energy production, battery storage system with penetration of electric vehicles. It aims the scheduling of the production of generation systems and the operation time of electrical home appliances and electric vehicles, as a target to minimize the electricity bill of the residential consumer. Different scenarios with various grouping of production and consumption systems have been presented to prove and confirm the efficacy of the proposed technique and to find the optimal solution.

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Activities of the  
European Lebanese Center  
for Industrial  
Modernisation (ELCIM)

## MoU with NDU

The Industrial Research Institute (IRI)/Euro Lebanese Centre for Industrial Modernisation (ELCIM) and Notre Dame University-Louaize (NDU) signed on April 25-2017 a memorandum of Understanding. The aim of this MoU is to create synergies and build bridges between universities and



Industries in Lebanon, in order to advise, guide and allow Lebanese food exporters to penetrate new markets with international norms, and help in developing the agro-food sector in Lebanon.

## Knowledge management workshop

ELCIM organized a public training on March 22nd-2017 under the topic of Knowledge Management; this training was held by Mrs. Pascale Hatem. The aim of this workshop was to enlighten the process of creating, sharing, using and managing the information of an organization, in achieving the objectives by making the best use of knowledge in terms of documents, people skills and resources. The purpose is to improve decision making capabilities and production cycle in a company in a shorter reaction time.

## The Lebanon SoftShore Cluster at SmartEx 2017

The Lebanon SoftShore Cluster participated in the SmartEx exhibition at the Forum de Beyrouth from the 11th till the 14th of May.

Three cluster members BSynchro, Looya and Intelligile shared a 36 sqm booth under LSS management.

The booth was quite dynamic as some companies had demos of their products and others opened the door for recruitment.

In the exhibition, 84 local exhibitors were present and a full agenda of conferences and seminars was prepared discussing the



latest topics and the local challenges. It was an opportunity for LSS to expose its activities and the advantages of a group work approach.

## LSS with Lebanon Software innovators at GITEX 2017 edition, in collaboration with IDAL

With the ultimate objective of supporting Lebanese software knowhow in a very competitive market, the LSS at the Industrial Research Institute (IRI) and in collaboration with the Investment Development Authority in Lebanon (IDAL) participated in Gitex 2017 edition. The booth managed by the Lebanon SoftShore Cluster (LSS) gathered seven leading Software companies : Aims, Intelligile, Ideatolife, Traggig, Probs, Ecomz and Levantnet. The GITEX Exhibition presented the latest technologies with a focus on Artificial Intelligence, Automotive Vehicles, Fintech, Cloud Computing, Virtual Reality and Robotics that are driving tomorrow-competitive economies



## LSS in Ivory Coast in collaboration with MEREf – ESA

**November 13, 2017**

The Lebanon SoftShore Cluster (LSS) participated in a 4 days business trip organized by the MEREf-ESA from the 13th till the 16th of November in Ivory Coast. The LSS contributed in this mission with the aim to support its member companies investigating business opportunities in this promising market.

Three LSS members took part in this trip and joined B2B meetings with local companies tailored upon each company needs by the Lebanese Chamber of Commerce and Industry in the Ivory Coast (LCCI-CI)





## Collaboration between the LSS and PUM in Netherland

**November 28, 2017**

In the framework of the continuous efforts in building the LSS capacities, a technical assistance mission was requested from the PUM in Netherlands with the aim of strengthening the marketing capabilities of the LSS and its member companies. Under the title ;“Marketing strategy and branding reinforcement of the LSS Cluster & LSS Cluster company members”, a marketing expert from the PUM senior expert program assisted the Cluster from the 21st till the 28th of November, 2017 in setting a roadmap strategy in order to enable the LSS and its member companies improve their market position on the local scene and international scene.



## IRI/ELCIM at Horeca 2017 edition

With the aim to serve better the Lebanese Industry, IRI through ELCIM participated in HORECA fair for the year 2017.

ELCIM provided series of presentations during this exhibition in special topics such as Microbial Hazards in the Food Service Industry-Contamination and Control- by Dr. Issmat Kassem, ELCIM Food Advisory Unit: Providing Service for the food sector by Mr.Fadi fayad, and Reducing Food Waste by Dr. Ahmad Abiad. ELCIM business advisors held meetings during this event with local and international experts. Professionals from different sectors visited IRI/ELCIM stand were advices and quick consultancies were delivered upon request.





## The Food Advisory Unit:

### Your new partner for developing and improving your food business: Information sessions at the Chambers about the Food Advisory Unit, a specialized unit developed by ELCIM

The Euro Lebanese Centre for Industrial Modernisation (ELCIM) organized three workshops at the Chambers of Beirut, Saida and Zahle under the title of: The Food Advisory Unit: your new partner for developing and improving your food business.

The workshops exposed the powerful mechanism of technical support established between ELCIM and a number of universities and Chambers of Commerce in Lebanon, which will be at the disposal of all food industries in the development of their business, help them resolve all kinds of technical and food safety issues, support them in the development of new products and other services relevant



to the food production and food export.

The Food advisory Unit (FAU) provides specialized technical services to the Agro-food sector and assists small and medium enterprises in the development and diversification of their products in order to become more competitive at the regional and international level, and help SME's increase their export.

## 2018 insights from CIT and ELCIM Centres

### Preparations to Launch the new programmes supported by IRI

Preparations are underway by CIT and ELCIM staff end of 2017 to launch beginning of 2018 of the new IRI supported programmes:

- The Innovation Vouchers, where limited vouchers amounting each up to 6000 USD are available for Lebanese entrepreneurs/researchers/innovators for innovative ideas at prototyping stage able to be commercialized.
- ELCIM SME Support Programme: a cofinanced technical assistance to SME's in order to

reinforce their capacities in their various production processes.

- The Scientific Platform ,linking research to manufacturing enterprises : a new initiative by the CIT to be launched in 2018 in order to reinforce the relations between academia and manufacturing SME' s with the aim of boosting innovation

### **CIT and ELCIM partners and beneficiaries in more than 10 EU ENI CBC partner projects**

Within the framework of the ENI CBC MED programme, The CIT and ELCIM collaborated in 10 EU projects amounting to a total budget of 30 Million Euros of which 4.5 Million constitute the total budget allocated to IRI. More than 50 partners from leading south MED and Northern MED institutions, universities and private enterprises are part of these consortiums.

Early results are expected in May 2018.

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Activities of Lebanese  
Cleaner Production  
Center (LCPC)

## Activities of the Lebanese Cleaner Production Center (LCPC)

The year 2017 was rewarding, the LCPC achieved targets set in its business plan.

Since its establishment, LCPC has been undertaking three core activities:

- In Plant Demonstration
- Awareness Raising
- Training and Capacity Building

The cumulative activities achieved and the total numbers of participants are shown in the 2 following graphs:

### **In plant demonstrations:**

Through In-plant demonstration projects, the LCPC explain in a practical way the concept of cleaner industrial production and its applications to industrial sector.

At the end of demonstration projects, the results are disseminated to all interested parties so that they can build on the successes of the demonstrations.

The selection of the sectors was based on evaluation criteria set by LCPC Advisory Committee. Through the demonstration projects, the LCPC has been training volunteers to become national CP experts, adept in conducting CP assessments in different industries. These trainees will eventually become the LCPC's national network of CP assessors capable of conducting full-scale CP in-plant assessments according the UNIDO CP methodology.

### **LCPC has collaborated with 39 Company in Lebanon distributed among several industrial sub- sectors. These sectors are:**

- Dairy sector
- Agro- food canning sector
- Paper and cardboard sector
- Aluminium production sector
- Ceramic production sector
- Plastic production and recycling sector
- Textile sector
- Olive oil sector
- Jewellery sector

The CP options implemented in SME's that participated in the LCPC programmes have led to a total yearly savings of 4,008,462 US Dollars.

### LCPC Services

- 264 events
- 3682 participants
- 39 small and medium enterprises
- 57 cleaning production experts
- 9 sectors
- 4,008,492\$ savings/year

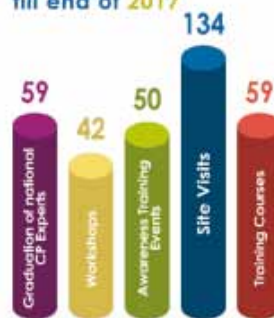
### LCPC SERVICES



### LCPC activities till end of 2017

- Graduation of national CP experts – 59
- Workshops – 42
- Awareness Training Events – 50
- Site visits – 134
- Training courses - 59

### LCPC activities till end of 2017



### Number of Participants in LCPC activities till end of 2017



### Number of participants in LCPC activities till end of 2017

- Awareness – 1510
- Workshops – 480
- Training - 1620

### MEDTEST

Workshop III Project activities with UNIDO and EU





## LCPC workshops

### Workshop on "Towards the Development of the National Strategy for Waste Management and the Adoption of the Integrated Solid Waste Management Law"

#### Advancing Green Technologies through Science-Policy Interface (ESCWA)

##### Awareness Raising

As part of the awareness campaign raised by the LCPC to spread the word about the CP concept and its application in Lebanon, the educational sector constitutes an essential and important sector



to spread the word among all students, and for the purpose of disseminating the CP Book: "Half is Enough: An Introduction to Cleaner Production" in the Universities for introducing CP Curricula.

**Let us implement the Half required, and then say enough.  
Do you think we will say enough?**

#### Awareness Raising at Universities.

##### *1- Training to the students of the Islamic University of Lebanon (IUL).*

##### *2- Training and Capacity Building*

This activity has been targeting industrial, environmental and financial stakeholders; namely decision-makers in industrial establishments, consultants, national experts, in addition to academic and research institutions.

The purpose is to build up skills not only in cleaner production but also in allied fields.

The LCPC has succeeded in conducting 59 training courses which targeted participants mainly students from the academic sector, managers and technical experts from the industrial sector and employees from the public sector and non-profit organizations.

Training course and capacity building events were held on subjects related to industrial and environmental issues namely the following:

- Performance of energy audits in the industrial sector.
- Implementation of environmental management systems based on CP.
- Advantages of CP in industry.



- CP assessments and their implementation.
- CP methodology and CP options

## International Events

### 1- Helsinki, Finland

*The General Assembly Meeting of UNIDO/UNEP*

RECPnet Global Conference 2017  
and The World Circular Economy  
Forum (WCEF) 2017



### 2- Cairo, Egypt

Fifth Arab Roundtable on Sustainable  
Consumption and Production



### 3- Amman, Jordan

WORLD SCIENCE FORUM



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Activities of the  
Center for Innovation  
and Technology (CIT)

## Energy efficiency and Renewable Energy Trainings at CIT

The Centre for Innovation and Technology (CIT) has launched a series of 3-hour trainings on Energy Efficiency in Building Design, delivered by Dr. Talal Salem, Associate Professor at Notre Dame University (NDU) and Dr. Elias Kinab, Associate Professor at Lebanese University (LU). The proposed trainings addressed architects, engineers, building professionals considering a consultancy job in the energy saving field. The trainings aimed at developing energy efficiency skills of Lebanese building stakeholders.

The first training on “Building Envelopes for Energy Efficiency Design focused on the following skills:

- To create energy and financial savings by reducing energy consumption;
- To reduce CO2 emissions produced by a building;
- To assess the current energy consumption and create action plan on how to reduce consumption.

A second training on “Building Energy Performance Assessment” was organized with the same speakers at IRI building. The training outcomes were:

- To learn how to assess the current energy consumption of a building;
- To identify the different energy services in building;
- To acquire the basics skills to model an energy efficient building using TRNSYS -Simulation Studio environment.



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IRI's cooperation with  
the Public Sector



## Relation with the public sector

The Institute acts on behalf of the Lebanese government and is authorized by it, to approve negotiations, sign agreements for mutual recognition of certificates of conformity in the trade exchange between Lebanon and other countries.

The Institute was tasked with the issuing of certificates of conformity in the importation of industrial goods, pursuant to the Lebanese decrees of mandatory specifications, and also in exportation operations in accordance with the specifications of the destination countries.

It should be mentioned here that since 2004, IRI has been the only internationally accredited body in Lebanon, as per the international accreditation certificate DIN EN ISO/ IEC 17025. Consequently, the Institute is the only window available for the flow of Lebanese goods, which need laboratory tests and certificates of conformity, to the European and international markets.

### ***Parliament***

IRI regularly accepts the invitations of parliamentary committees in the Lebanese parliament, and attends meetings held by them. IRI offers its technical and scientific expertise related to the Institute's scope of work to these committees during the drafting and discussion of bills.

IRI actively participated in the drafting and discussion of the bill on technical regulations and pertinent procedures for conformity assessment, in all stages of the process, with the subcommittee of the joint parliamentary committees, until the bill was approved by this committee at the end of September, 2011. IRI participated in the drafting of the bill regulating drinking water processing, treatment and packaging, with the Committee on Public Health, Labor and Social Affairs.

The bill aims to limit the unregulated and exploding number of drinking water distribution companies in Lebanon, as a result of the growing need of the citizens for water that is otherwise unavailable through public drinking water grids. The bill seeks to subject most unlicensed bottling companies to the laws and regulations in force, in order to ensure the safety of water, that it is uncontaminated, and that it complies with the required specifications to preserve public health.

IRI also participated in the activities of the Public Works and Energy Committee in several areas, including:

- Following up the process of replacing domestic gas bottles, especially the control of the production and exportation of gas bottles before they are used in local markets.
- Providing the necessary expertise and technical analysis related to fuels allowed in private cars.
- Offering opinion and technical analysis related to bills concerning public safety in the use of fuel tanks, with a view to prevent explosion.
- Expressing an opinion about the draft food safety law.
- Expressing an opinion about the draft law on electronic transactions and data of a personal nature

### ***Ministry of Industry***

IRI is considered to be the quintessential technical arm of the Lebanese Ministry of Industry, especially as IRI is a subsidiary body of the ministry, and that its Board of Directors is headed by his Excellency the Minister of Industry. IRI is continuously conducting the necessary industrial inspections and studies, as well as feasibility studies aimed at developing existing industries or establishing new ones. This is in addition to conducting studies on the added value of national industrial products and the need for certificates of origin for export clearance. Also, the Institute worked in parallel with the ministry in granting industrial licenses, pursuant to decree No. 8018 dated 20/6/2002, which assigned the required role for IRI in this regard, and is still working in parallel with the ministry whenever it is required to do so.

### ***Ministry of Agriculture***

The Ministry of Agriculture requests IRI to analyze samples from agricultural products or material on a frequent basis. These are usually sent to IRI by the ministry for testing, whether upon importing them, exporting them or their usage. IRI is also tasked with the analysis of fertilizers and pesticide residues in vegetables, fruits and other crops.

### ***Ministry of Economy and Trade***

Since its inception, IRI has been cooperating with the Ministry of Economy and Trade, especially the Consumer Protection Directorate and the General Directorate of Cereals and Sugar beets.

#### **A - Consumer Protection Directorate**

This directorate is tasked with taking samples from local markets on a regular and ongoing basis, and handing them over to IRI for laboratory testing and issuance of the necessary reports, across various sectors. IRI comprises 14 accredited laboratories covering different sectors, in addition to a control and inspection unit, the meteorological calibration unit and the Lebanese Welding Centre.

#### **B - General directorate of Cereals and Sugar beets**

The Industrial Research Institute manages and operates the work of the central laboratory for grains, flour and bread research on behalf of the Ministry of Economy and Trade. The laboratory is equipped in accordance with highly specialized international cereal laboratories. The laboratory meets all the needs of this directorate by controlling the quality of the imported and the locally produced wheat and wheat products (briefly, monitoring the ingredients that make up the Lebanese bread loaf).

### ***Ministry of Public Health***

IRI laboratories are used by the Ministry of Public Health in conducting special tests on bottled water, as a fundamental step in the process of obtaining a license for the water bottling companies, in addition to other tests conducted by the instituted which include, for example, baby formula, cosmetics, medicine and other items as needed.

The ongoing regulatory campaign launched by the Ministry of Public Health during 2014, required a continuous coordination with the Ministry which was and still sending a large number of samples daily so that the IRI conduct necessary tests and provide technical advice.

In its laboratories, the Institute conducted analysis and tests for thousands of samples brought by the Ministry of Health monitors, and results were given within the required time period, sometimes immediately. The Institute was not surprised by the unprecedented quantity and quality of samples brought by the Ministry of Health monitors.

### ***Ministry of National Defense***

The cooperation with the Lebanese army, including its various interests and divisions, has been firmly established since IRI's inception. IRI meets the requests of the committee tasked with the receipt of the analyzed materials and the central reserve committee for foodstuff analyses, the stewardship for uniforms and equipment, in addition to the requests of the corps of engineers, the logistical corps and the military police and other corps as needed. IRI also holds training courses on welding works, solar energy and other scientific topics which IRI proudly provides to this institution.

### ***Ministry of Interior and Municipalities***

The Textile, Leather and Rubber Laboratory at IRI is continuously cooperating with the security in analyzing the uniforms of the Internal Security Forces, as well as shoes and equipment, in accordance with their requirements and in order to certify the conformity of these specimens with the specifications established by them, prior to purchasing uniforms and gear.

IRI meets the various requests by the Internal Security Forces in different unmentioned sectors, including for example chemical analyses to identify contraband and other security-related analyses.

### ***Ministry of Justice***

The judicial authorities continuously refer legal issues to IRI for technical advice, as IRI is the reference point for these authorities in what pertains to scientific issues.

### ***Ministry of Energy and Water***

IRI works with the Ministry of Energy and Water in different areas, most importantly overseeing the manufacturing of gas bottles and certifying that they conform to the mandatory Lebanese standards. IRI also inspects gasoline tanks in petrol stations, whether for licensing purposes or for maintenance when requested.

In addition, IRI inspects the nominal load of fuel tankers, in addition to other inspections that are conducted at the behest of the ministry.

IRI also conducts studies and offers technical consultation in national issues when requested, issues that fall under the scope of both the ministry's work and IRI's fields of expertise.

### ***Ministry of Environment***

IRI continually cooperates with the requests of the Ministry of Environment, whether by analyzing samples to assess their negative environmental impact, or whether by providing the Ministry of Environment with its services in the field of the inspection and auditing of factories, before suggesting the optimal approach in the production process in order to mitigate the latter's negative environmental impact.

IRI also hosts the Lebanese Cleaner Production Centre (LCPC), which was established as a result of the cooperation among the Ministry of Industry, the Ministry of Environment, UNIDO and Austria. This centre's main objectives include ensuring compliance with environmental standards during the different stages of production, something that is beneficial in terms of reducing costs by keeping waste in check on the one hand, and improving the environment by recycling wherever possible during the production process on the other hand.

### ***Customs***

Collaboration with the Lebanese customs is mainly done in the fields of enforcing and verification of conformity with the mandatory specifications required for goods imported to Lebanon, and which are subject to customs restrictions. This is done according to a specific and known mechanism. The Customs authorities, according to the customary procedure, can send samples to IRI for analysis and for identification of their components, prior to clearing them for entry into the local markets.

### ***Lebanese Standards Institution (LIBNOR)***

IRI worked diligently to establish the Lebanese Standards Institution (LIBNOR), which is tasked with issuing the Lebanese standards. In the beginning, this institution was established in the campus of IRI, which incubated its operations until it was reactivated in 1998. Since then, IRI published approximately one thousand national standards for the institution, as per annual contracts that were in force from 1998 until 2004. IRI is currently represented in the institution's Board of Directors, while IRI is permanently represented in the technical committees tasked with issuing and updating the national standards.

### ***The Lebanese Council for Accreditation (Colibac)***

Some time ago, IRI realized that the infrastructure of a world-class quality process must include the following items:

1. Bodies for conformity assessment that implement these specifications. This role is primarily assumed by IRI in Lebanon, not only in the application of national standards, but also in the application of international standards in export operations as IRI is internationally accredited according to Certificate No. 17025 .
2. A national institution for the issuance of national standards, which in Lebanon is the Lebanese Standards Institution (LIBNOR), a body that is ever striving to improve its role.
3. Oversight of the local market. This function is tasked to the Consumer Protection Directorate at the Ministry of Economy and Commerce .
4. A national council for accreditation, whose tasks include accrediting laboratories, monitoring

commissions, conformity assessment for products and processes in the country. This national institution was not yet established in Lebanon, and IRI sought hard to establish it in order to complete the quality infrastructure at the level of national institutions, until the decree of its establishment was issued in 2004, while the decree to establish its Board of Directors was issued in 2006. IRI is represented in the Board of Directors of the Lebanese Council for Accreditation (Colibac).

This council is still in the process of drafting its bylaws, which are nearing completion. Work is also underway to speed up the passing of the necessary legislations that will enable the council to start its operations and serve the purpose it was created for.



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**IRI's Relations with  
the Private Sector**

## ***Industrialists***

IRI allots great importance to industrialists and industry in Lebanon. Nine years ago, IRI concluded an agreement with the Association of Lebanese Industrialists whereby it granted industrialists a fifty percent discount on the costs of all laboratory analyses, in accordance with the list adopted by IRI more than ten years ago. The services provided by IRI to the industrialists are as follows:

### **A – Analysis requests with the aim of improving**

The quality of production or finding solutions to production problems Any industrialist can head to IRI to request an analysis of a product produced in his factory with the aim of improving its quality, or as a result of a particular problem he is facing during production. At that point, cooperation and follow-up begin with the industrialist.

In most instances, his request becomes a process of applied research with which these analyses either end up in improving the quality of the product or determining the underlying cause of the production problem and subsequently, working on solving this problem.

### **B – Pre-export Analysis**

There are many products that cannot be exported to foreign markets without first being analyzed. As IRI is internationally accredited pursuant to certificate No. 17020, its accreditation is recognized by more than 120 countries, rendering it virtually the sole window through which Lebanese goods that comply with technical specifications can flow into the European and global markets, owing to the certificate of conformity issued by IRI.

Therefore, industrialists head to IRI to conduct the analyses required by the destination countries, in order to obtain certificates of conformity for their products which would give them access to international markets.

### **C – Product Certification**

This is an optional program that any factory that meets the conditions can request, for implementation in its facilities according to a contract with IRI and a specific mechanism at the latter; this would enable the factory to obtain IRI's conformity mark for its products, in an ongoing and continuous manner. IRI would oversee production through periodical analyses and inspections, before granting the factory certificates of conformity whether for export purposes or for ensuring the conformity of its products to national standards. This takes place in a routine manner, and also on demand, and its cost is factored in into that of the program.

## ***Merchants***

There are goods that are subject to mandatory national standards. For this reason, importing such goods is subject to customs restrictions that stipulate their conformity to the mandatory national standards. This is verified by IRI prior to allowing these goods into domestic consumer markets.

Hence, the relation between the importers and merchants on one hand, and IRI on the other hand is constantly evolving. Efforts are underway, on a continuous basis, to facilitate trade exchange on one hand, and to verify the conformity of imported goods following a scientific method on the other hand. Many merchants voluntarily head to IRI to request tests and analyses of their merchandise and products, in order to determine their conformity with international standards in the case of export, or national standards in case of import, prior to shipping it from the country of origin.

### ***Farmers***

IRI's laboratories continuously cooperate with farmers. In truth, many farms voluntarily head to IRI and request their products to be analyzed.

IRI provides analysis for farmers for the following products:

- Olive oil
- Honey
- Vegetables and fruits (pesticide residue)
- Irrigation water
- Meat and fish
- Other agro-food products.

### ***Researchers and scientists***

Many researchers and scientists head to IRI to conduct tests and analyses necessary for their scientific research. Most of the time, their requests become applied research projects, as they are aware of IRI's capabilities in this area. This is not to mention the fact that IRI houses 14 laboratories spanning many complementary disciplines, in addition to the meteorology laboratory, the Lebanese Welding Centre, the Euro-Lebanese Centre for Industrial Modernization, the Lebanese Cleaner Production Centre, and the Centre for Innovation & Technology.

### ***Consumers***

The relationship between consumers and IRI is either direct or indirect, through the civil organizations and associations concerned with consumer protection, the environment and other fields.

#### **Direct relationship**

Any citizen can go in person to IRI in order to test any product, substance or other items, which is what is often done by citizens to ascertain the safety of what they consume, be it drink, food, supplies, household electric appliances, building materials, petroleum products and other daily items.

#### **Indirect relationship**

Consumer protection associations and other civil organizations often head to IRI and request analyses and tests of an environmental or health safety nature. Cooperation with these organizations is done on a continuous basis by IRI, which meets all the former's requests in return for special fees that take into account their conditions in most cases. If these requests were not complimentary, then they would be symbolic, in a bid by IRI to support and encourage these groups to work for the public good.

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Exhibitions

## The IRI bolsters its Presence and Activities in Specialized and Multidisciplinary Exhibitions

The Industrial Research Institute constantly contributes to general economic activities and figures prominently in various fairs and trade shows where it can share its concepts, activities and expertise. The IRI makes and maintains strong connections with the exhibitors and the participants in these activities. Thus, the institute's participation became annual and periodic in most of the fairs, forums and exhibitions, such as the HORECA fair, the Made in Bekaa exhibition, the energy events, etc.

### Job and Orientation Fair and Forum 2017

In 2017, the Industrial Research Institute (IRI) took part in the 12th Job and Orientation Fair and Forum, which was held on 14 and 15 March in the Faculty of Sciences campus at the Lebanese University in Fanar.

This event aimed at paving the way for many institutions to meet the university's graduates, professors and visitors. Simultaneously, it was designed to give the students the possibility of meeting a large number of companies offering a wide array of job opportunities. The exhibition allowed the companies and institutions, participating in the event, the opportunity to enhance their knowledge about the diversity of the university's educational programs, courses and majors, as well as showcasing their products and services.



### HORECA 2017 Exhibition in Lebanon

Under the patronage of the Minister of Tourism, Mr. Avedis Guidanian, the Industrial Research Institute and the Euro-Lebanese Centre for Industrial Modernization (ELCIM) participated in HORECA 2017. This fair is one of the largest annual exhibitions for the hospitality and food service experts in Lebanon and the region. HORECA was held in BIEL exhibition center in Beirut from April 4 to 7, 2017.

During the trade show, ELCIM organized a series of short presentations on topics that are of interest to food stakeholders, in addition to meetings with technical experts in various fields.





## Made in Bekaa II

The Industrial Research Institute took part again in an annual exhibition organized by the Chamber of Commerce, Industry and Agriculture of Zahlé and Bekaa. The “Made in Bekaa II” event took place between 4 and 6 August 2017 in Joseph Tohme Skaff Park, in Zahlé.

Political, security and diplomatic officials attended the opening ceremony, as well as entrepreneurs, businessmen, industrialists and other stakeholders from different Lebanese regions. They were welcomed by the vice president of the Chamber of Commerce, Industry and Agriculture of Zahlé and Bekaa, and the event was under the patronage of the Minister of Industry, Dr. Hussein Hajj Hassan. During the opening ceremony, the institute was awarded a shield of honor.



## 8th International Beirut Energy Forum

As usual, the Industrial Research Institute participated in the 8th edition of the International Beirut Energy Forum (IBEF), which took place from 18 to 20 September 2017 at Le Royal Hotel in Dbayeh. It had several activities and a permanent stand displaying IRI’s general services and presentations on the energy activities carried out by the institute.

Dr. Imad Hage Chehade lectured during the forum on IRI’s energy activities, namely the solar power production at the institute, the awareness raising through the Ecotruck vehicle, the energy laboratory and the training platform on the solar cells technology, among others.



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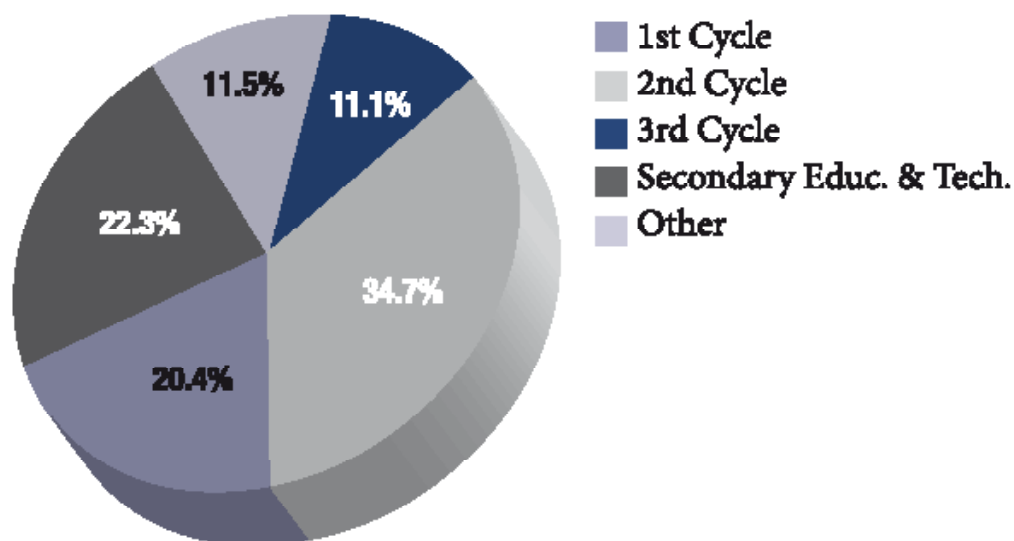


Development of  
Human Resources

The number of IRI staff members amounted to 161 at the end of 2017; 70% are males, while 30% are females. The average age is around 34 years.

They can be categorized according to the level of their education:

- 18 hold a 3rd Cycle
- 56 hold a 2nd Cycle
- 33 hold a 1st Cycle
- 36 are in their secondary and technical studies
- 18 are in other categories.



Elementary Level	No.	%
3 <sup>rd</sup> Cycle	18	11,1
2 <sup>nd</sup> Cycle	56	7,34
1 <sup>st</sup> Cycle	33	4,20
Secondary Educ. & Tech.	36	3,22
Other	18	5,11

Average Age	Gender	
34 years	70% male	30% female

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On-going  
Employee Training

## International training, seminars & workshops

Participant	Organizer	Object/Title	Date	Location
Antoine Fayçal	ROX	الكشف على معمل قوارير غاز مصنعة من المواد المركبة انتاج شركة Hexagon Ragasco	16-21/01/2017	Norway
Amine Jbeily	ICC - International Association for Cereal Science and Technology	ICC Presidents Meeting Vienna	6-8/02/2017	Vienna, Austria
Selim Kfoury	المنظمة العربية للصناعة والتعددين	الاجتماع الأول لفريق عمل ربط الأكاديميا بالصناعة في الدول العربية	24-25/04/2017	Rabat, Morocco
Imad Kahil	JSMO & PTB	Advanced course on pre-packages	7-18/05/2017	Amman, Jordan
Robert Haddad	المنظمة العربية للصناعة والتعددين	ISO 5725 و ISO 13528 و IEC 17043 البرنامج التدريبي حول	25-28/09/2017	Cairo, Egypt
Sandra Sarkis Ramzi Bhamdouni Richard Skaff	Dubai, UAE	GITEX Technology week 2017	08-12/10/2017	Dubai, UAE
Rola Sleiman	Federcasa	RELS 2 - New EU ENI Project	11/10/2017	Rome, Italy
Amine Jbeily	CGPRDI (China Grain Products Research and Development Institute)	Taiwan visit	30/10-03/11-2017	Taiwan
Elias Maalouf	Arab Industrial Development & Mining Organization	الاجتماع الخامس للجمعية العمومية للبرنامج العربي للمترولوجيا القانونية	31/10-02/11/2017	Riyad, KSA
Imad Hage Chehadeh	The Italian Ministry of the Environment, Land, and Sea And the WEC Lebanon Committee	ECOMONDO 2017	7-10/11/2017	Rimini, Italy
Amine Jbeily	Health Grain Forum - ICC	6th international Whole Grain Summit 2017	12-16/11/2017	Vienna, Austria
Joseph Matta	Eurolab	Eurolab National Members' Meeting 2017	16-17/11/2017	Paris, France
Robert Haddad Mohamad Hajjar	الوكالة الوطنية للتحكم في الطاقة ANME	الاجتماع السادس لشركة شمسي	07-08/12/2017	Tunisia



## MISSIONS (Trainers, Experts & Speakers)

Participant	Organizer	Object/Title	Date	Location
Joseph Matta	The Lebanese Ministry of Agriculture and the Faculty of Agricultural and Food Sciences of The Holy Spirit University of Kaslik	Agriculture and Land: Reality, Solutions and prospects	27/10/2017	Regional University Center (RUC), Zahle
Joseph Matta	LIBNOR and ISO	Environmental Management Systems and Life Cycle Assessment	27-29/11/2017	Crowne Plaza Hotel. Hamra
Joseph Matta	LIRA program	LIRA 13 Forum of technology and industrial innovation	14/12/2017	Dbayeh convention center
Imad Hage Chehad	University Institute of Beirut - Lebanese University Saida	Solar Energy Efficiency in Lebanon	18/12/2017	Lebanese University - Saida

## Local training, seminars & workshops

Participant	Organizer	Object/Title of the training	Date	Location
Mohamad Hajjar Naji Abi Zeid	The WEC Lebanon Committee	The National Renewable Energy Action Plan for Lebanon (NREAP 2016-2020)	12/01/2017	Hilton Metropolitan Palace, Sin El Fil
Wadad Daher Halim El Bayeh	QualityLab s.a.r.l.	Introduction of the new LCMS QQQ (Qsight) & Overview on Perkin Elmer Products range	16/02/2017	Hilton, Habtoor, Sin El Fil
Robert Haddad	LIBNOR	Involving the Education sector in standardization	21/02/2017	Crowne Plaza Hotel, Hamra
Dany Tahchy	LIBNOR	Train the trainers for chairing technical committees	22/02/2017	Crowne Plaza Hotel, Hamra
Imad Hage Chehad	المجلس الوطني للبحوث العلمية مركز الاسكوا للتكنولوجيا بالتعاون مع وزارة الشؤون التنموية الادارية	المنظومة الوطنية لنقل التكنولوجيا	23/02/2017	السراي الكبير - بيروت
Siham Youssef	USEK	Food Safety and Nutritional Security in the Lebanese Army	28/02/2017	USEK
Thomas Sabbagh	OMSAR	Recruitment	05/03/2017	Online

Participant	Organizer	Object/Title of the training	Date	Location
Thomas Sabbagh	OMSAR	Ethics	07/03/2017	Online
Hanna Francis	ELCIM	Knowledge Management	22/03/2017	Gefinor Rotana Hotel, Hamra, Beirut
Thomas Sabbagh	OMSAR	Succeeding as an Occasional Trainer	29/03/2017	Online
Elie Melky Marc Cherfan Elias Bechara Joseph Matta	The European Union, Switchmed and UNIDO	Switchmed trainings on Product Environmental Footprint Methodology	27/03/2017 28/03/2017 29/03/2017	Radisson Blu Martinez Hotel, Ain El Mreisseh, Beirut
Stephanie El Asmar	OMSAR	Coaching	04/04/2017	Online
Thomas Sabbagh	OMSAR	Presentation Skills	11/04/2017	Online
Stephanie El Asmar	OMSAR	Conducting Meetings	20/04/2017	Online
Thomas Sabbagh	OMSAR	Effective Public Speaking	05/05/2017	Online
Mohamad Hajjar Bilal Houssein	The Lebanese Center for Energy Conservation (LCEC)	Minimum Energy Performance Standards (MEPS)	10/05/2017	Crowne Plaza Hotel, Hamra
Imad Hage Chehaddeh	LIBNOR & ISO	ادارة الطاقة ضمن مشروع ISO MENA STAR	15-19/05/2017	Hilton Habtoor - Sin El Fil
Mohamad Hajjar	LIBNOR & ISO	National training on Energy Management Standards (with Focus on ISO50001)	17/05/2017	Hilton Habtoor - Sin El Fil
Ahmad Hassan Mohamad Kassem	LIBNOR & ISO	National training on Energy Management Standards (with Focus on ISO50001)	18-19/05/2017	Hilton Habtoor - Sin El Fil
Siham Youssef	مصلحة حماية الفكرية في والمنظمة العالمية للملكية الفكرية وزارة "WIPO" الاقتصاد والتجارة	ندوة شبه اقليمية حول العلامات التجارية	22-23/05/2017	مبنى المجلس الاقتصادي والاجتماعي - وسط بيروت
Amine Jbeily	The Ministry of Agriculture, The Food and Agriculture Organization of the United Nations & The American University of Beirut	Towards the Enhancement of the Mediterranean Diet in the Mediterranean region-The case of Lebanon	24/05/2017	AUB - Beirut

Participant	Organizer	Object/Title of the training	Date	Location
Eliane Sawma Awad	معهد باسل فليجان المالي والاقتصادي	البرنامج التدريبي حول "تعزيز النزاهة من خلال الرقابة والتدقيق الداخلي"	6-8/06/2017	معهد باسل فليجان المالي والاقتصادي
Hanna Francis	OMSAR	اجتماع المنسقين للبحث في المواضيع المتعلقة بمشروع التدريب الالكتروني OMSAR E-Learning Project	15/06/2017	مكتب وزير الدولة لشؤون التنمية الادارية - ستاركو
Stephanie El Asmar	OMSAR	Delegation	05/07/2017	Online
Joseph Matta	Green Mind NGO & The United Nations Development Program in Lebanon	Lebanon Climate Act	10/07/2017	USJ Beirut
Mohamad Hajjar	The Lebanese Center for Energy Conservation (LCEC) & SHAMCI represented by The Regional Center for Renewable Energy and Energy Efficiency (RECREE) and the National Institute of Germany (PTB)	SHAMCI Regional workshop	19-20/07/2017	Crowne Plaza Hotel, Hamra
Amine Jbeily	The Ministry of Public Health in Lebanon	Chemical event surveillance - Technical task Force Meeting	21/07/2017	Holiday Inn Hotel - Beirut
Antoine Fayçal Mohamad Hajjar	LCEC & Ecofys, Germany	IKI project Lebanon Kick-off Meeting Accelerating 0-emission building sector ambitions in the MENA region	27/07/2017	Gefinor Rotana Hotel, Beirut
Stephanie El Asmar	OMSAR	Succeeding as an Occasional Trainer	21/08/2017	Online
Sahar Estephane Raymonde Khaz-zaka	Ibrahadad et fils	Chromatography and QC Labs analytics seminar	23/08/2017	Phoenicia Hotel, Beirut
Ahmad Habli	The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) & The Lebanese Center for Energy Conservation (LCEC)	Solar Pumping Training	6-8/09/2017	Radisson Blu Martinez Hotel, Beirut

Participant	Organizer	Object/Title of the training	Date	Location
Imad Hage Chehadeh Bilal Houssein Mohamad Hajjar	LCEC & WEC	The International Beirut Energy Forum 2017	18-20/09/2017	Le Royal Hotel - Dbayeh
Mohamad Hajjar	The Italian Trade Agency in Beirut (ITA Beirut) & The Italian Ministry for the Environment, Land and Sea (IMELS)	Workshop with 8 italian companies	19/09/2017	(IBEF 2017) Le Royal Hotel, Dbayeh
Jihad Hajj Chehadeh	Lebanese Franchise Association (LFA)	Supercharge your Hospitality Sales	21-22/09/2017	Phoenicia Hotel, Beirut
Elias Dib	نقابة المهندسين في بيروت - اللجنة العلمية	الخطة الشاملة لترتيب الأراضي اللبنانية الرؤية والتحديات	25/09/2017	نقابة المهندسين، بيروت
Ziad Moukarzel	معهد باسل فليحان المالي والاقتصادي	البرنامج التدريبي حول "مهارات بناء وتحليل المسوحات الميدانية"	25-27/09/2017	معهد باسل فليحان المالي والاقتصادي
Gilbert Fadel	المؤسسة العامة للتنمية والترويج لمدينة أضنه واتحاد الغرف اللبنانية والسفارة التركية في لبنان	جسر التجارة بين بيروت وأضنه	27/09/2017	Phoenicia Hotel, Beirut
Imad Hage Chehadeh	USAID Lebanon	Building a rule of law society: to enhance bases of Democratic Governance and Rule of law	02/10/2017	Parliament of Lebanon, Beirut
Thomas Sabbagh	OMSAR	Coaching	10/10/2017	Online
Stephanie El Asmar	OMSAR	Motivating People	11/10/2017	Online
Fady Melhem	Union Internationale des Ingénieurs et des Scientifiques utilisant la langue Française (UISF) & L'Ordre des Ingénieurs et Architectes de Beyrouth	Les Ressources Energétiques au Liban	12-13/10/2017	Maison de l'Ingénieur, Beyrouth
Mahmoud Amhaz Taher Wehbe	CNRS & ESCWA	Technology Management, Innovation Protection and commercialization Training	19-20/10/2017	CNRS premises, Beirut

Participant	Organizer	Object/Title of the training	Date	Location
Tarek Hakim Marc Tahchy	PROCEQ	Revolutionary Change in Non-Destructive Testing	20/10/2017	Lancaster Tamar Hotel, Beirut
Joelle Saikaly	Food & Agriculture Organization of the United Nations (FAO) and World Food Programme in Lebanon (WFP)	Change the future of migration	23/10/2017	Coral Beach Hotel, Beirut
Naji Abi Zeid	The Institute of Finance / Governance CCIA - BML in Lebanon and Banque du Liban	Corporate Governance Practices: For a better and sustainable economic performance	31/10/2017	ESA Campus, Beirut
Richard Skaff	معهد باسل فليجان المالي والاقتصادي	تدريب المدربين في مجال ريادة الأعمال والمشروعات الصغيرة والمتوسطة	27/11-01/12/2017 04-08/12/2017	معهد باسل فليجان المالي والاقتصادي
Hovig Kouyoumjian	الشركة اللبنانية للصناعات الغذائية الحديثة ش.م.م	لقاء	16/11/2017	مجمع غاردينيا غران دور الصناعي
Rabih Issa	معهد باسل فليجان المالي والاقتصادي	عقود الأشغال وصيانتها	8-10-15-17/11/2017	معهد باسل فليجان المالي والاقتصادي
Tarek Hakim	ESCWA - The Directorate General of Oil - The National Council for Scientific Research (CNRS) and The Association of Lebanese Industrialists (ALI)	National System for technology transfer with case studies in Gas related industries	04/12/2017	The Ministry of Energy and Water premises, Beirut
Imad Hage Chehaddeh	USAID Lebanon	Building a rule of law society: to enhance bases of Democratic Governance and Rule of law	06/12/2017	Parliament of Lebanon, Beirut
Stephanie El Asmar	OMSAR	Motivation Techniques	06/12/2017	Online
Elias Dib	APBEL الجمعية اللبنانية لمنتجي الباطون الجاهز	The official launching of the Quality regime for concrete	18/12/2017	Ministry of Industry - Sami Solh Street - Beirut



## Local Meetings, Inaugurations & Exhibitions

Participant	Organizer	Object/Title	Date	Location
Mohamad Zeaiter Carine Slaiby	Lebanese University - Faculty of Sciences	Annual Job Fair2017	14-15/03/2017 14/03/2017	Lebanese University- Fanar Campus
Elias Kinab Fadi Fayad Manale Tabanji Maya Khatib Naji Abi Zeid Ramzi Bhamdouni Richard Skaff Sandra Sarkis	Hospitality Services	HORECA 2017	04-07/04/2017	BIEL - Beirut
Naji Abi Zeid Sandra Sarkis Ramzi Bhamdouni Richard Skaff	MICE Lebanon	SamartEx	11-14/05/2017	Forum de Beyrouth
Richard Skaff Dany Tahchy Mohamad Zeaiter Mohamad Haidar	غرفة التجارة والصناعة والزراعة في زحلة والبقاع	صنع في البقاع ٢	04-06/08/2017	بارك جوزق طعمة سكاف - زحلة
Bilal Houssein Ahmad Habli Dany Tahchy Aline Jreijiry Fady Melhem	LCEC & WEC	The International Beirut Energy Forum 2017	18-20/09/2017	Le Royal Hotel - Dbayeh

## LIBNOR

Participant	TC No.	Standard Title	Date
Mark Tahchy	NLTC 59	EN 13282-1 / EN 15102 / EN 15824 / EN 16153	05/01/2017
Raymonde Khazzaka	TC34 / SC7	NL 677 الزعتن	10/09/2013 02/10/2013 06/03/2014 24/04/2014 13/05/2014 08/05/2015 19/05/2015 11/06/2015 02/07/2015 15/07/2015 15/09/2015 22/12/2015 11/02/2016 22/08/2016 25/10/2016 14/10/2016 29/11/2016 10/01/2017
Halim El Bayeh	NLTC 1011	NL 719 لصاقات المواد الغذائية	20/03/2017 03/05/2017

Participant	TC No.	Standard Title	Date
Mark Tahchy	TC 138	EN 61386-1/21/22/23/24/25	16/02/2017 09/06/2017
Halim El Bayeh	NLTC 54	ISO 11023 - 11024-2 - 11024-1 - ISO 17494 - ISO 18321 - ISO TR 21092	06/07/2017
Halim El Bayeh	TC 1017	NL 604 الاغذية الخلوة من الغلوتين	09/08/2017
Taher Wehbe	NLTC 28	ISO 8222 - ISO 91 - ISO 11223	11/07/2017 03/08/2017
Mark Tahchy	TC 59	Building Materials EN 12057 - EN 1467 - EN 12059	24/08/2017
Mark Tahchy	TC 138	Plastic Pipes EN 598 - EN 1092 - EN 16631 - ISO 877-1/2/3 - CEN/TR 16470	17/08/2017 14/09/2017
Dany Tahchy	NLTC 3012	Safety rules for the construction and installation of lifts	02/06/2017 15/10/2017 02/08/2016 15/10/2017 30/07/2015 15/10/2017
Tarek Hakim	TC 44	EN ISO 15609 Part 1 - Part 2	28/11/2017

## IRI SEMINARS/CONFERENCES

Participant	Organizer	Object/Title of the training
Mohammad Hafi	Electrical Lab-IRI	Performing tripping characteristic Test for CB
Elie Dawaliby	Electrical Lab-IRI	Performing of the lead acid Batteries Test
Antoine Fayçal Robert Haddad Elias Dib Bilal Houssein Eliane Sawma Awad	IRI & FREA Formation- France	IRCA CERTIFIED ISO 9001:2015 AUDITOR TRANSITION TRAINING COURSE
Achraf Arabi	GCS Lab-IRI	Training on Hydrostatic pressure equipmentt
Ahmad Wehbe	Electrical Lab-IRI	IP tests for protection indicated by the first & second characteristic numeral
Mehyline Habli	Electrical Lab-IRI	Marking and dimensions for lead acid batteries
Mohamad Kassem	Electrical Lab-IRI	Power quality analyzing using the Fluke machine (P-ANAL/ELC-01)
Mohamad Kassem	Electrical Lab-IRI	Power input and current (clause 10 of IEC 60335-1)
Selim Kfoury Joseph Matta Imad Hage Chehadeh	IRI - AIDMO - ISESCO	الملتقى العربي حول سبل تحسين الشراكة مع الصناعة (استخدامات تقنيات النانو)
Thomas Homsy	Electrical Lab-IRI	Leakage current and electric strength

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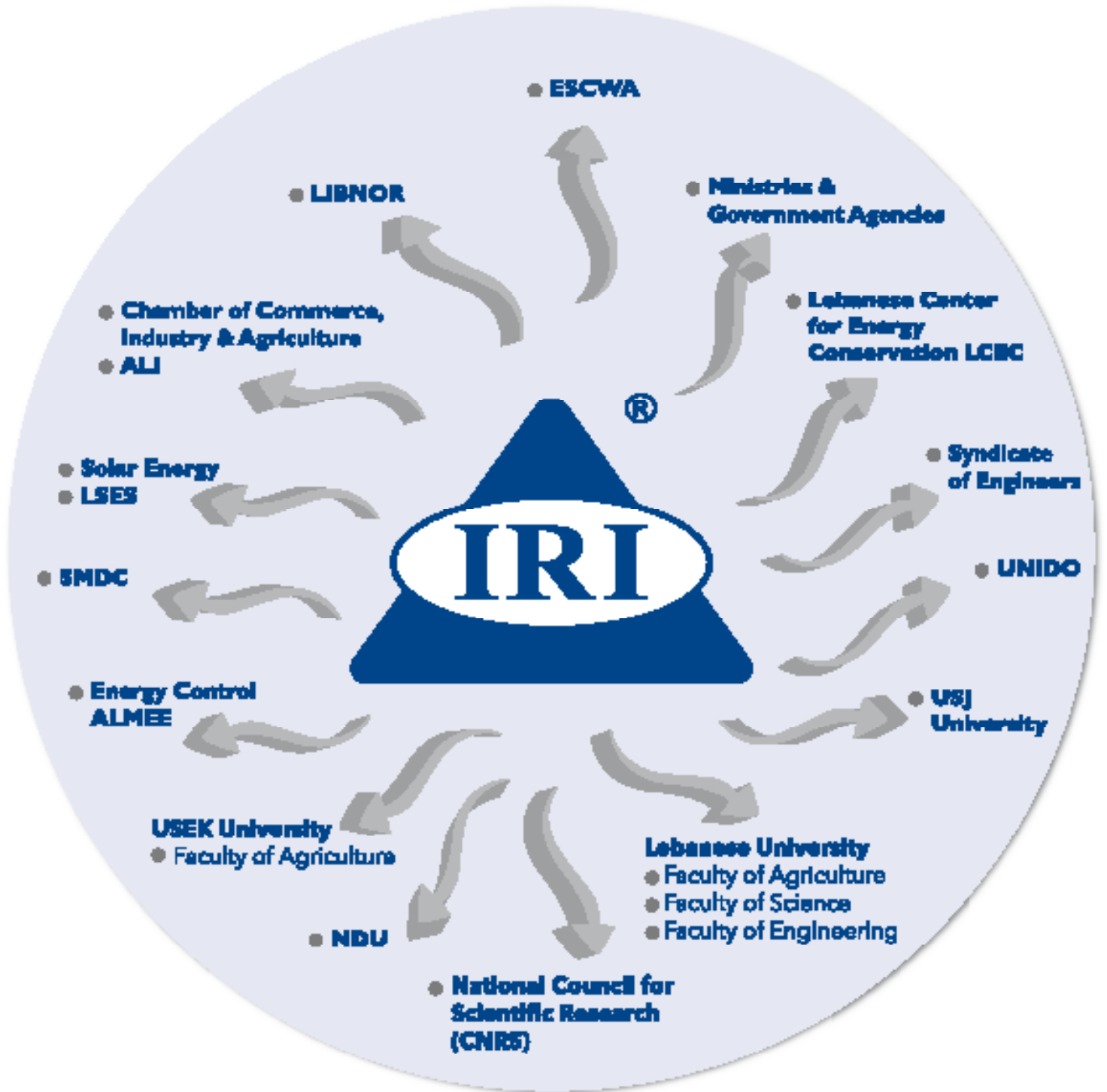


International  
& Local Partnerships

# INTERNATIONAL PARTNERS



# LOCAL PARTNERS





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Decrees, Laws  
and Decisions

## Law

Law		Official Gazette		Subject	Authority
Nbr	Date	Nbr	Date		
23	10/02/2017	8	16/02/2017	Conclusion of the Euro-Mediterranean Regional Convention on rules of origin as part of the Euro-Mediterranean Partnership Agreement.	Parliament
51	07/09/2017	42	14/09/2017	Approving the conclusion of a protocol between the Republic of Lebanon and the European Community in order to establish a mechanism for the settlement of disputes regarding the trade provisions of the Euro-Mediterranean Partnership Agreement signed between the European Community and its member states, and the Republic of Lebanon.	President of the Council of Ministers
51	07/09/2017	44	21/09/2017	To correct a typographical error in Law No. 51, dated 7 September 2017, relating to “the approval of the conclusion of a protocol between the Republic of Lebanon and the European Community in order to establish a mechanism for the settlement of disputes regarding the trade provisions of the Euro-Mediterranean Partnership Agreement signed between the European Community and its member states, and the Republic of Lebanon.	

## Decree

Decree		Official Gazette		Subject	Authority
Nbr	Date	Nbr	Date		
622	25/04/2017	20	04/05/2017	Conclusion of the Euro-Mediterranean Regional Convention on rules of origin as part of the Euro-Mediterranean Partnership Agreement.	President of the Republic

## Decisions

Decision		Official Gazette		Subject	Authority
Nbr	Date	Nbr	Date		
٦٧٧٩/٢٠١٧	18/12/2017	1	04/01/2018	Technical requirements and specifications for equipping water treatment and bottling plants.	Ministry of Industry

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Communication  
& Media

# بزنس جورنال

Business Journal

تصدر في حقوق نشر مشتركة مع مجلة «عالم المصارف» ومجلة «الخليج»

العدد رقم 50 - السنة التاسعة - تشرين الثاني / أيار 2017  
Issue No. 50 - 9th year - OCT/NOV 2017



**حوار مع د. بسام الفران (المدير العام)**  
معهد البحوث الصناعية: ٦٤ عاما من كفاءات العلم والخبرة والاختصاص والأجهزة العلمية الحديثة في خدمة الصناعة اللبنانية والاقتصاد الوطني



Business Journal, issue nr. 50, 9th year, Oct/Nov 2017



Meeting of the Arab Industrial Research Centers at the Industrial Research Institute



HEC Paris in Beirut



Manbar Al Hadath - Interview with Dr. Bassam Frenn, IRI's Director General



Nanotechnology in the Stars of Science program



Role of the Industrial Research Institute in monitoring the public safety



Laboratories of the Industrial Research Institute



Applied research at the Industrial Research Institute



International accreditation of IRI's laboratories



# الديار

العدد ١٠٠٧ - العدد ١٠٠٧ - حزيران ٢٠١٧

## تلقي دعوة لوضع حجر الأساس لمعهد البحوث الصناعية عون اطلع من الحاج حسن على مشروع تشبيد المدن الصناعيّة والتقني سلامة

التبني الجديد في إطار  
تغليب الخدمات التي  
يخدمها التعاون  
مؤسسات التصنيع  
والصناعة والابتكار  
والتعاون الفني مع وزارة  
الصناعة وسائر الجهات  
والهيئات الجامعية  
والعسكرية الرسمية  
والخاصة بهدف تطوير  
البحث العلمي في المجالات  
التطبيقية التي لها  
على الصناعة أو طبقة  
والصناعة القبلية. ويتم  
المعهد اليوم مرافق بحث  
وبراسات وتكنولوجيا  
المعلومات الحديثة في  
الخدمات الصناعية في العديد  
من التخصصات وأصبح  
المعهد محطاً في مختلف  
مستويات عالية ويعتمد  
تقنيات علمية واسعة عبر شبكات الإنترنت  
والقوائم الإجماعية الخاصة في تحويل جزء  
مهم حقله إلى الطاقة الكهربائية والإنتاج  
الطاقة.

وقد تولى الرئيس عون بالجمهورية اللبنانية  
الوزير الحاج حسن وتوقيع عقد من أجل تطوير  
الصناعة في لبنان وتوقيع الصكوك الخاصة  
وتأمين الأسواق لتسهيل الإنتاج الصناعي  
التبني والمدن من القاعة الخارجية.  
وعرض رئيس الجمهورية الأوضاع الحالية  
والصناعة في البلاد، مع ملاحظة بعض النقاط  
مجلس الوزراء بعد توجيهه مبدئياً خاتمة المحضر  
الرئيسي.



الرئيس عون ورئيس الوزراء الحاج حسن والرئيس التنفيذي للمعهد الصناعي

استقبل رئيس  
الجمهورية اللبنانية  
عون أمس وزير الصناعة  
الحاج حسن في قصر  
العمير العام للوزارة  
حضوراً من وزير  
المعهد الصناعي  
العلمي، والممثل  
القانوني لمؤسسة  
الصناعة والتنمية  
في لبنان كرسيليو  
بازيني، وللممثل  
والقانوني في معهد  
الصناعة سليم علوي،  
والرئيس التنفيذي  
الوزير جوزيف  
حسن في مقدمته  
مؤسسة تطوير  
الصناعة في لبنان.

وتم توقيع عقد  
التعاون بين  
مؤسسات البحث  
والتطوير في  
القطاع الصناعي  
في لبنان. وسيتم  
البدء في تنفيذ  
المشروع في  
الوقت القريب.  
وتم توقيع العقد  
في حضور  
الرئيس عون  
والوزير الحاج  
حسن والرئيس  
التنفيذي للمعهد  
الصناعي جوزيف  
حسن والرئيس  
القانوني للمؤسسة  
الصناعية سليم  
علوي والرئيس  
القانوني في معهد  
الصناعة سليم  
علوي والرئيس  
التنفيذي للمعهد  
الصناعي جوزيف  
حسن في مقدمته  
مؤسسة تطوير  
الصناعة في لبنان.

# الانوار

حزيران ٢٠١٧ - العدد ١٠٢٦

## رئيس الجمهورية تابع مع زواره الاتصالات المتعلقة باعداد قوانين الانتخاب ومواضيع سياسية



الرئيس عون ورئيس الوزراء الحاج حسن والرئيس التنفيذي للمعهد الصناعي



الرئيس عون ورئيس الوزراء الحاج حسن والرئيس التنفيذي للمعهد الصناعي

تلقي الرئيس  
الجمهورية  
عون  
الوزير  
الحاج حسن  
في قصر  
العمير  
العام  
للوزارة  
حضوراً  
من  
وزير  
المعهد  
الصناعي  
العلمي،  
والممثل  
القانوني  
لمؤسسة  
الصناعة  
والتنمية  
في لبنان  
كرسيليو  
بازيني،  
والممثل  
القانوني  
في معهد  
الصناعة  
سليم  
علوي،  
والرئيس  
التنفيذي  
الوزير  
جوزيف  
حسن في  
مقدمته  
مؤسسة  
تطوير  
الصناعة  
في لبنان.

وقد تولى الرئيس  
عون بالجمهورية  
اللبنانية الوزير  
الحاج حسن وتوقيع  
عقد من أجل تطوير  
الصناعة في لبنان  
وتوقيع الصكوك  
الخاصة وتأمين  
الأسواق لتسهيل  
الإنتاج الصناعي  
التبني والمدن من  
القاعة الخارجية.  
وعرض رئيس  
الجمهورية الأوضاع  
الحالية والصناعة  
في البلاد، مع  
ملاحظة بعض  
النقاط مجلس  
الوزراء بعد  
توجيهه مبدئياً  
خاتمة المحضر  
الرئيسي.

وقد تولى الرئيس  
عون بالجمهورية  
اللبنانية الوزير  
الحاج حسن وتوقيع  
عقد من أجل تطوير  
الصناعة في لبنان  
وتوقيع الصكوك  
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الإنتاج الصناعي  
التبني والمدن من  
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وعرض رئيس  
الجمهورية الأوضاع  
الحالية والصناعة  
في البلاد، مع  
ملاحظة بعض  
النقاط مجلس  
الوزراء بعد  
توجيهه مبدئياً  
خاتمة المحضر  
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وقد تولى الرئيس  
عون بالجمهورية  
اللبنانية الوزير  
الحاج حسن وتوقيع  
عقد من أجل تطوير  
الصناعة في لبنان  
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في البلاد، مع  
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النقاط مجلس  
الوزراء بعد  
توجيهه مبدئياً  
خاتمة المحضر  
الرئيسي.





## إشادة، شفافية وإنجازات معهد البحوث الصناعية

زار وزير الدولة لمكافحة الفساد نقولا تويني مقر معهد البحوث الصناعية في الحدث (حرم الجامعة اللبنانية) حيث استقبله وزير الصناعة الدكتور حسين الحاج حسن والمدير العام للمعهد الدكتور بسام القرن وأعضاء مجلس إدارة المعهد وأنضمّ إلى جلسة مجلس الإدارة المنعقدة لدراسة جدول الأعمال وأطلع على المناقشات وعلى آليات اتخاذ القرارات في ضوء المعطيات الموضوعية والدقيقة للمنوفة. وكان مجلس الإدارة يناقش بعد إتمام مناقشة لبناء مبنى جديد وعصري للمعهد بتعمول يأتي وذلك انطلاقاً من الوقر الذي يحققه المعهد إستناداً إلى السياسة والإدارة الحكيمة والمنظمة التي يتبناها المدير العام بحسب ما أوضح لوزير الحاج حسن.

وأقدم الدكتور القرن شرحاً تفصيلياً عن تطور النشاط في المعهد وفي مختلف أنحاء الأقسام والمختبرات الحائزة على شهادات الاعتماد والجودة من الشهادات

وهيئات المختبرات الأمريكية والأوروبية، لا سيما منها الفرنسية والألمانية. وتحدث عن آليات العمل المتسارعة والمتطورة والشفافة في المؤسسة حيث أصبحت المعاملات ممكنة بشكل كامل، مما يفتح أمام صاحب العلاقة متابعة سير المعاملة ONLINE، من دون الحاجة إلى المراجعة المباشرة. كما اطّلع الدكتور القرن لوزيرين على البرامج والأنشطة والمشاريع التي ينفذها المعهد بالشراكة مع الاتحاد الأوروبي على صعيد تطوير الصناعة اللبنانية وتحديثها ومساعدتها على النمو.

وقال: "بات معهد البحوث الصناعية يتفاعل مع القطاعين العام والخاص بشكل كبير الأمر الذي يعنون ويرافق ويشدّد على عمليات الإستيراد والتصدير كي تلتقي متلائمة مع المواصفات والمعايير وأصبح المعهد سباقاً في ميادين عديدة في الأبحاث العلمية والدراسات والأنشطة التكنولوجية المتطورة وذلك في ضوء الشراكة التي نسجها مع مؤسسات بحثية وعلمية دولية وأوروبية مشهود لها بكفاءتها وبرمجيتها، إضافة إلى تطوير مختبراته وتجهيزها بأفضل المعدات واعتمادها آليات الفحوص المتقدمة وفق المعايير الأوروبية".

ثم تحدث الوزير الحاج حسن مرحباً بالوزير تويني قائلاً: إن معهد البحوث الصناعية تاريخاً حافلاً بالإنجازات ورغم الصغار الكلي الذي لحقه خلال الحرب إنطلقت عملية إعادة إعمارها بعد العام 1991 وبدأ المسار التطويري من عشرة موظفين في العام 1997 إلى 109 موظفاً اليوم ومن مئة مليون ليرة كموازنة عامة في العام 1997 إلى عشرة مليارات ليرة كموازنة اليوم ومن مختبر واحد شبة عتري الاختصاصات، كما أصبح المعهد عضواً في منظمات بحثية عالمية ويعتبر تطبيقات علمية واسعة عبر شبكات الإنترنت والتواصل الإجتماعي كما حوّل جزءاً من مصدر الطاقة فيه إلى الطاقة الشمسية والإنتاج الأنظف ونحن اليوم في صدد الإنتهاء من تحديث النظام الناظمي للمعهد لتحقيق المزيد من العصرية والحداثة والشفافية والإنتاجية. وتعتبر أن في النقلة اللبنانية معالم مشيئة كثيرة أبرزها معهد البحوث الصناعية. وإن للمعهد نورين أساسيين على صعيد الأبحاث العلمية وعلى صعيد الفحوص المخبرية والخدمات".

وشدّد الوزير الحاج حسن على وجود نقاط بياض في أداء المسؤولين والموظفين في الدولة إذ ليس كل الموظفين وكل الدولة وكل الناس فاسدين. والفساد موجود في القطاع العام والخاص لكن الأغلبية ليست فاسدة ونحن من واجبنا مكافحة الفساد حتى لا نتعمم صفة الفساد بسبب الأقلية الفاسدة. على الأكثرية غير الفاسدة محاربة الفساد بقوة لتحفظ الإقتصاد وهوية الدولة.

وتنخّن نفتخر بدور معهد البحوث الصناعية ولقاء الموظفين الشفاف والناجح على كل المستويات لم تساهم الدولة في موازنة المعهد منذ ست سنوات ورغم ذلك استطاع تحقيق وفر مالي سيعطي كلفة تشييد بناء جديد للمعهد ولولا الشفافية والإنتاجية في المعهد لما توصلنا إلى هذه الإنجازات. ويعود الفضل إلى الوزراء الذين سبقوني وأعضاء مجلس الإدارة السابقين والحاليين والمدير العام والموظفين".

ثم ألقى الوزير نقولا تويني كلمة أشاد فيها بمنافقة الوزير الحاج حسن وجدديته في العمل وجرمته على أن يكون في مجلس الوزراء صوت الصناعي والمزارع والمنتج. وقال: أعرب عن تقريي برؤية معهد البحوث الصناعية، هذه المؤسسة الرائدة والناجحة واعتبر هذا الصرح خط الدفاع الأول لحماية المجتمع اللبناني من البضائع المغشوشة وفي تطوير الإنتاج. هذا الخط هو خط المعرفة والصناعة والإبتكار. وكما يقول فخامة رئيس الجمهورية العماد ميشال عون سنعمل على تحويل الاقتصاد الريعي والظرفي إلى الاقتصاد الإنتاجي والعمري برسمال العقل اللبناني المبدع والمبتكر وطالما لدينا الإرادة الوطنية يمكننا تحقيق هذا الهدف. ولوكد أن المعهد يقوي بنية الصناعة ويحافظ على إستقلاليتنا



ودوره أساساً في المحافظة على حماية لبنان من دخول منتجات غير سالحة عبر الحدود. لقد لسبح لبنان حراً اليوم ومحسناً ضد الإحتلال الإسرائيلي وضد التكتويرين والحدود مصانة بقوة المجتمع إن الإنتاج ينظم المجتمع نحن لسنا بلداً مقلداً وليس كله فساداً بكفي جلد النفس. هناك تخطيط كبير يجب وضع حد له. ليس كل الناس مشوهين أو مقسدين أو فاسدين نحن بلد ادبه طاقات مبدعة وخلاقة ويجب أن نحافظ على إستقلاليتنا وبالإمكان تقليص الدين العام بقرار موازنة تحمل رؤية اقتصادية واضحة".

### جولة تفقيية

ثم قام الوزيران الحاج حسن وتويني والدكتور القرن وأعضاء مجلس الإدارة بجولة تفقيية في الأقسام والمديريات والمختبرات.