CAHFSA
CARIBBEAN AGRICULTURAL HEALTH & FOOD SAFETY AGENCY

IICA

11th European Development Fund (EDF)

"Support to CARIFORUM States in furthering the implementation of their Economic Partnership Agreement (EPA) commitments and in meaningfully reaping the benefits of the Agreement"

SANITARY AND PHYTOSANITARY MEASURES (SPS) PROJECT

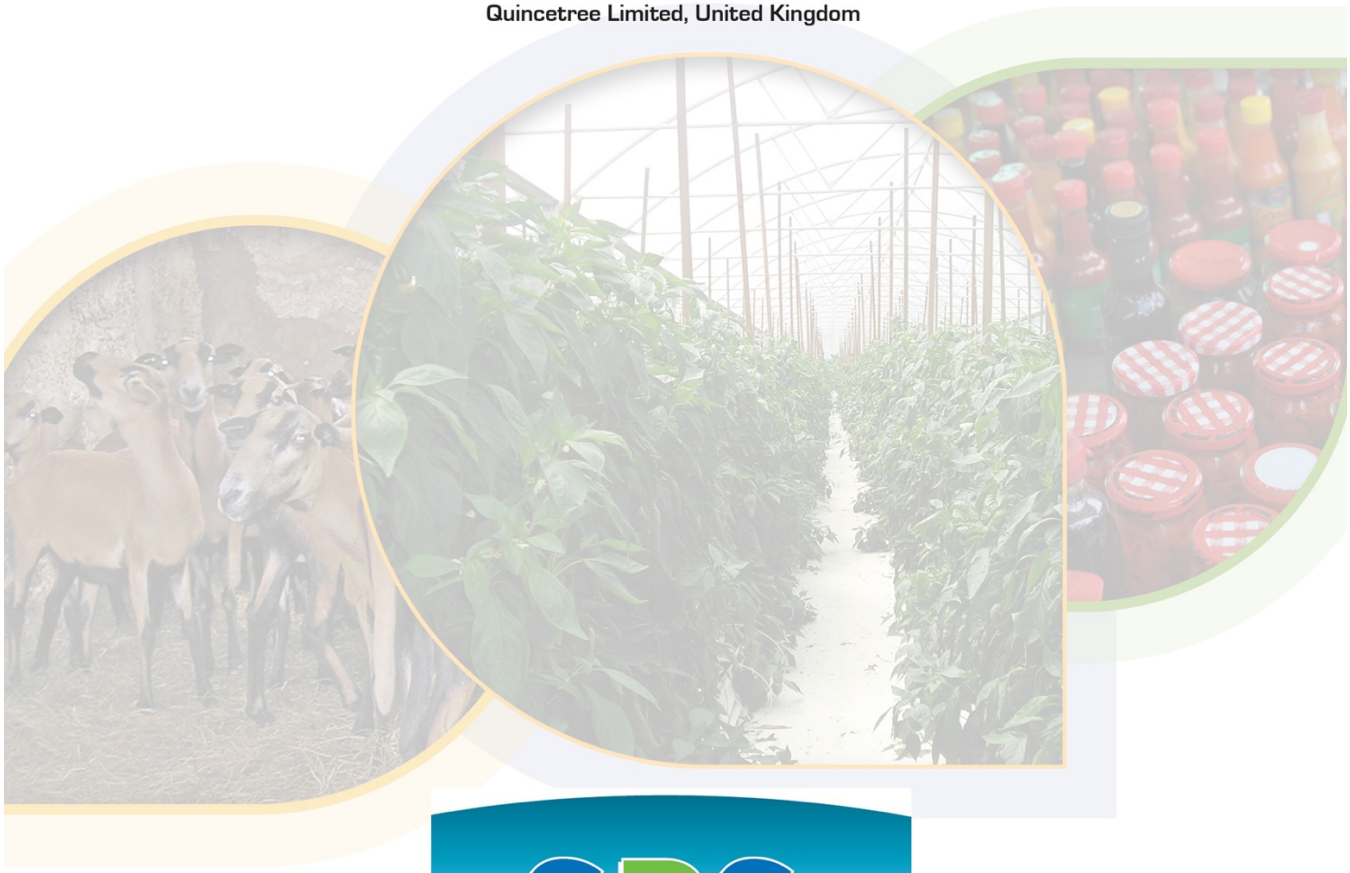
REGIONAL AGRICULTURAL HEALTH AND FOOD SAFETY POLICY AND ACTION PLAN

CARICOM CRFM CARIFORUM

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of Inter-American Institute for Cooperation on Agriculture and do not necessarily reflect the views of the European Union.

REGIONAL AHFS POLICY AND ACTION PLAN

Based on a situational analysis prepared by
Quincetree Limited, United Kingdom



11th EDF SPS Project:

"Support to CARIFORUM States in furthering the implementation of their Economic Partnership Agreement (EPA) commitments and in meaningfully reaping the benefits of the Agreement"

"This action was funded by the European Union under the 10th European Development Fund – Sanitary and Phytosanitary Measures (SPS) Project being executed by the Inter-American Institute for Cooperation on Agriculture (IICA)".

TABLE OF CONTENTS

ABBREVIATIONS

ACP	African, Caribbean and Pacific
AHFS	Agricultural Health and Food Safety
ALOP	Appropriate Level of Protection
ASF	African Swine Fever
CAC	Codex Alimentarius Committee
CAEDRS	The Caribbean AHFS Early Detection and Response System
CAHFSA	Caribbean Agricultural Health and Food Safety Agency
CARAPHIN	Caribbean Animal and Plant Health Information Network
CARDI	Caribbean Agricultural Research and Development Institute
CAREC	The Caribbean Epidemiology Centre
CaribVET	Caribbean animal health network
CARICOM	Caribbean Community

CARIFORUM	Caribbean Forum of African, Caribbean and Pacific States
CARPHA	Caribbean Public Health Agency
CIRAD	Caribbean Agricultural Research Centre for International Development
CPHDF	Caribbean Plant Health Directors Forum
CRFM	Caribbean Regional Fisheries Mechanism
EDF	European Development Fund
EPA	European Partnership Agreement
FAO	Food and Agriculture Organization of the United Nations
FBD	Foodborne Disease
FBI	Foodborne Infection
FBP	Foodborne Poisoning
HPAI	Highly Pathogenic Avian Influenza

IICA	The Inter-American Institute for Cooperation on Agriculture
IPPC	International plant Protection Convention
OIE	World Organisation for Animal Health
PAHO	Pan American Health Organization
RSCB	Regional Sectoral Coordination Bodies
SPS	Sanitary and Phytosanitary
TADs	Transboundary Animal Diseases
UNEP	UN Environment Programme
USD	United States Dollars
VPH	Veterinary Public Health
WHO	World Health Organization of the United Nations
WTO	World Trade Organisation

HOW TO READ THIS DOCUMENT

This document is divided into two sections.

Section 1 starts with the policy context and presents an analysis of the most pressing and fundamental regional AHFS challenges. Interim conclusions, which are highlighted in green boxes, define the specific scope of the policy.

Section 2 provides the policy elements. The aim of the policy is prescribed and explained and, based on a defined approach and principles, the actions are outlined. Further details, including, timelines and indicators, are attached in the Action Plan.

SECTION 1

Policy Context

1. INTRODUCTION

This evidence-based *'Regional Agricultural Health and Food Safety Policy and Action Plan'* provides CARIFORUM decision makers with an insight into the key systemic challenges to national and regional human, plant, animal, veterinary, public and environmental health, as well as appropriate mechanisms and technically valid, appropriate measures driven by data collection systems to address these challenges

The Policy and Action Plan was developed prepared by Quincetree Limited (United Kingdom). This contribution to Strengthening the Agricultural Health and Food Safety Policy Framework in the Caribbean was funded by the **11th European Development Fund (EDF) Support to CARIFORUM States in furthering the implementation of their Economic Partnership Agreement (EPA) commitments and in meaningfully reaping the benefits of the Agreement.**

This Policy and Action Plan is focussed on strengthening the robust foundation and framework for sustainable, effective and efficient Regional Agricultural Health and Food Safety (AHFS) mechanisms. It aims to enhance the efficacy of the AHFS system by identifying priority challenges along the entire food chain and the actions that will address them in an integrated and comprehensive way. Cooperation and coordination of AHFS measures and actions are essential, at the regional level on issues most appropriately addressed regionally, and at the national level through the provision of support to member state authorities in dealing with challenges. The agreed actions will contribute to the achievement of the appropriate level of protection (ALOP) of human, plant, animal, veterinary, public and environmental health as well as the optimum facilitation of intra-regional and international agri-food trade.

Considerable effort has been expended and progress achieved in modernising and aligning Sanitary and Phytosanitary (SPS) regulation across the region with international trade obligations and with systems and norms of key trading partners. The safe and sustainable economic development of the region necessitates the inclusion of human, animal, plant and environmental health protection as an integral part of the regional agri-food policy.

While the policy is ambitious, it is targeted and practical to ensure that it is realistic in its objectives and that it takes into consideration the current challenging situation and available resources. The attached Action Plan sets out the concrete measures to achieving those goals over a four-year period and is a vital component of the ongoing long-term phased strategic process.

2 BACKGROUND

The Inter-American Institute for Cooperation on Agriculture (IICA), which is the implementing agency for the 11th European Development Fund (EDF) Sanitary and Phytosanitary (SPS) Measures Project, and the Caribbean Agricultural Health and Food Safety Agency (CAHFSA), a collaborator under the Project, are seeking to strengthen the AHFS Policy Framework in the Caribbean in order to develop a more coherent, coordinated and focused approach to addressing AHFS issues.

This Regional AHFS Policy document is a key output of the 11th EDF SPS Measures Project '*Support to CARIFORUM States in furthering the implementation of their Economic Partnership Agreement (EPA) commitments and in meaningfully reaping the benefits of the Agreement*'. This, in turn, is a follow up to the 10th EDF SPS Project '*Support to the Forum of Caribbean States in the implementation of the*

commitments undertaken under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary (SPS) Measures', in which it was recommended, *"that a regional AHFS policy is developed to address the dynamic risk situation to animal health, plant health and food safety."*

2.1 REGIONAL POLICY AND REFORM CONTEXT

In common with regional integration efforts around the world, Caribbean Forum (CARIFORUM) regional policies should address issues that can best be handled at the regional level, in accordance with the *principle of subsidiarity*[1].

In line with the principle of subsidiarity, this policy identifies priority regional systemic issues concerning the early detection of and timely response to regional AHFS threats that can best be addressed at the regional level.

All elements of an effective national AHFS system have been specified in the Self-assessment tool[2], which provides the means to evaluate the current level of achievement and targets and proposes a pathway for improvement. The effectiveness of regional AHFS mechanisms is a function of the capacity of the national systems, which will need to be developed in parallel.

Existing relevant policies

Included in the activities identified in the ***Strategic Plan for the Caribbean Community 2015–2019: Repositioning CARICOM***[3] was an initiative, ***Developing a fully integrated and harmonised Regional Agricultural Health and Food Safety System***. Work is ongoing to achieve that ambitious objective.

On 17 January 2020, Chief Veterinary Officers (CVOs) of the Caribbean Community (CARICOM) provisionally endorsed the ***Draft Regional Policy on Trade in Animals and Animal*** **Products** at a meeting in Georgetown, Guyana. Member states were asked to further review and provide, if necessary, written comments. The formulation of the policy was a mandate of the 48th Meeting of the Council for Trade and Economic Development (COTED). The aim was to provide the framework with which to address the challenges currently affecting member states in relation to cross-border issues including non-tariff measures, SPS issues and the general capacity enhancement gaps that currently exist. The main rationale for the creation of the policy was to facilitate and create an effectively regulated environment for trade in animals and animal products, thereby guaranteeing the supply of high-quality products, as well as enhancing food safety throughout the region. To this end, the policy reinforces the need for safeguarding the health of citizens and the productivity of the livestock sector from the risk of entry, establishment and spread of animal, zoonotic and foodborne pathogens, while providing adequate access to quality food.

---

[1] The principle of subsidiarity aims to ensure that decisions are taken as closely as possible to the citizen and that constant checks are made to verify that action at the regional level is justified in light of the possibilities available at national, regional or local level. Specifically, it is the principle whereby regional action is not undertaken unless it is more effective than action taken at national, regional or local level.

[2] As developed within the 10th EDF Sanitary and Phytosanitary Measures (SPS) Project: Development of a Regional Coordination Mechanism for Agricultural Health and Food Safety Systems in the CARIFORUM Region *Support to the Caribbean Forum of ACP States in the Implementation of Commitments Undertaken Under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS)* CaRC/BB/SPS-EOICN01/15

[3] https://caricom.org/wp-content/uploads/STRATEGIC-PLAN-2016_opt.pdf

The policy will also ensure that CARICOM is compliant with animal disease surveillance procedures, such as those established by the World Organisation for Animal Health (OIE).

At the 32nd Inter-Sessional Conference of the Heads of the Government of CARICOM, held in February 2021, a strategy entitled, ***Advancing the CARICOM Agri-Food Systems Agenda; Prioritising Regional Food and Nutrition Security***, was proposed and endorsed as part of the 'Regional Food Systems Dialogue'. It was intended to synthesise the position of CARICOM in preparation for the United Nations Food Systems Summit as part of 'The Decade of Action to achieve the Sustainable Development Goals by 2030'. [4]

A Special Ministerial Task Force on Food Production and Food Security was established to monitor and provide guidance on the implementation of the strategy, '***Advancing the CARICOM Agri-Food Systems Agenda; Prioritising Regional Food and Nutrition Security***' and ensure efficiency and effectiveness in its implementation. The result would be the transformation of the agri-food system into one that is resilient, provides attractive and sustainable wealth creation opportunities for potential investors, and guarantees food and nutrition security for the region. Priority actions include the creation and implementation of a regional trade and information portal and adoption and implementation of ***Regional Policy on Trade in Animals and Animal Products***, which is ongoing.

Success requires that the AHFS systems and mechanisms at the regional level are operating efficiently, so Regional AHFS Sectoral Coordination Bodies (RSCBs) are constantly working to improve their effectiveness based on their own as well as external needs assessments and plans:

The Caribbean Plant Health Directors Forum (CPHDF) is working on a five-year strategic plan to guide the work of the Forum, based on the seven priority areas identified at their evaluation meeting in December 2019.[5]

- The Caribbean Animal Health Network (CaribVET) undertook an external evaluation[6] in 2017, which specified fourteen recommendations.
- The Caribbean Public Health Agency (CARPHA) has developed a Pathway to 2025 strategic plan 2018 to 2020[7].
- The first Strategic Plan of the Caribbean Regional Fisheries Mechanism (CRFM) covered the period 2003–2011 which was followed by an independent performance review and is now implementing its second strategic plan (2013–2021).
- The Caribbean Agricultural Research and Development Institute (CARDI) is implementing its Strategic Plan 2018–2022, which is the Institute's five-year road map for transforming regional agriculture into a modernised, competitive, innovative and resilient sector.

All policy initiatives in the region are aligned with international standards and best practice as defined by relevant international organisations, including the International Plant Protection Convention (IPPC), Codex Alimentarius Committee (CAC) and OIE strategic plans, as well as the United Nations Sustainable Development Goals.

[4] https://dpi.gov.gy/president-dr-mohamed-irfaan-ali-address-to-the-caricom-regional-food-systems-dialogue/#more

[5] http://www.cphdforum.org/wp-content/uploads/2020/08/13_CPHD_End_Press-Release.pdf

[6] https://www.caribvet.net/about-the-network/assessment/external-evaluations/1st-external-evaluation

[7] https://www.carpha.org/Portals/0/Documents/CARPHA-Strategic-Plan-2018-2020.pdf

3. RATIONALE AND PROBLEM ANALYSIS

This section summarises some of the key AHFS challenges faced by the region. A more detailed description and analysis can be found in the annexed Situational Analysis [Annex 2], which was done as part of the problem analysis in preparation for the development of this Policy and Action Plan. The situation analysis is based on a literature review, the result of the 2021 Self Assessment [Annex 3], the responses to the Policy Consultation Questionnaire [Annex 4], as well as knowledge gained by the consultancy team from working in the region.

3.1 KEY CHALLENGES IN PLANT HEALTH

In 2018, the CPHD Forum through a pest prioritisation exercise developed a priority pest list for the Region. The pest list includes: *Ceratitis capitata* [Mediterranean fruit fly], *Fusarium oxysporum* f.sp. *Cubense* [causes Panama disease of banana], *Tuta absoluta* [tomato leafminer], *Ralstonia solanacearum* race 3 biovar 2 [causes potato brown rot], *Moniliophthora roreri* [causes Frosty Pod Rot], *Candidatus Phytoplasma palmae* [causes lethal yellowing], *Xanthomonas axonopodis* pv. *citri* [causes citrus canker], *Citrus leprosis virus C* (CiLV-C), Fiji disease and Bacterial Panicle Blight.

The following were the most frequently received responses from the public sector to the policy consultation questionnaire on priority pest threats: Panama Disease Tropical Race 4 (TR4) – banana, Mediterranean fruit fly or medfly (*C. capitata* Med), Fruit flies - *Bactrocera* spp. West Indian Fruit Fly, and Citrus Huanglongbing (HLB) citrus greening disease. The private sector representatives also provided a variety of threats; the most frequently selected was Huanglongbing (HLB).

The regional challenge faced by the plant health bodies, is to understand the regional prevalence and dynamics of plant pests and diseases at an early stage and to identify and coordinate the most effective actions at the regional level to minimise their spread and negative impact.

3.2 KEY ANIMAL HEALTH8 CHALLENGES – ANIMAL DISEASES AND ZOONOSES

The available information from both regional and international organisations, including the OIE[9], on the regional epidemiological situation with respect to animal diseases in CARIFORUM is scarce and incomplete. Based on data available on the CaribVET official website and from thematic scientific papers, it can be assumed that CARIFORUM is apparently free from some of the transboundary animal diseases that persist in Latin America (such as foot and mouth disease, Classical swine fever and porcine reproductive and respiratory syndrome) and remains exposed to others.

Certain tick-borne diseases caused by *Ehrlichia ruminantium*, *Anaplasma marginale* and *Babesia* spp. (including *Babesia bovis* and *Babesia bigemina*) and parasites are common in most CARIFORUM member states, but the qualitative and quantitative data on incidence, prevalence and economic impact of these hazards is not available. The risk posed by tick-borne diseases transmitted by *Amblyomma variegatum*

[8] Animal welfare (OIE definition: "the physical and mental state of an animal in relation to the conditions in which it lives and dies" is subsumed within the concept of animal health and serves as a pre-condition for ensuring animal health but is not a focus of this current policy and so not explicitly addressed. https://www.oie.int/en/what-we-do/animal-health-and-welfare/animal-welfare/

[9] *OIE-WAHIS, which contains very little, outdated or no data on CARIFORUM member states on which to basis solid analysis*

and *Boophilus microplus* is also commonly known, but the available data on their patterns and trends at the national level has very little or no analytical value.

According to the Food and Agriculture Organization of the United Nations (FAO), the Caribbean region is considered to be at risk for zoonotic diseases because of widespread backyard breeding systems, diverse disease surveillance systems, and legal or illegal human and animal movements. Several zoonoses were reported including influenza, West Nile, rabies and Leptospirosis[10].

Compared with information on animal diseases in general, the available information on zoonoses[11] provides a greater understanding of the general epidemiological situation with respect to animal-borne pathogens in CARIFORUM. Data has been gathered from CaribVET, the Caribbean Agricultural Research Centre for International Development (CIRAD), the Pan American Health Organization (PAHO), the World Health Organization of the United Nations (WHO), the Caribbean Epidemiology Centre (CAREC) and CARPHA[12]. A collation of the data suggests that certain strains of *Orthomyxoviruses* (which causes avian influenza) and *Lyssaviruses* (which causes rabies), are still in endemic circulation in populations of animals and birds (both domestic and wild). This poses a threat to animal health and veterinary public health (VPH) across the region.

The available information indicates that there are particular risks to animal health and VPH in CARIFORUM from dengue virus, hepatitis E virus and hantaviruses, as well as by *Leptospira* spp. *Rickettsia* spp. (typhus) and *Coxiella burnetii* (Q fever). A series of studies revealed a significant prevalence of these infections in the population and the environment.

Only a small number of member countries have dedicated VPH services. However, at the regional level, CaribVET has VPH working group focussing on the priority diseases of Rabies, Salmonellosis and Leptospirosis

In completing the policy consultation questionnaire, the most frequently-received responses from the public sector with respect to the key perceived VPH disease threats were: African swine fever, foot-and-mouth disease and the highly pathogenic avian influenza (HPAI). In the private sector, most respondents selected HPAI and anti-microbial resistance as the key perceived VPH threats.

The regional challenge faced by the animal health bodies, is to understand the sources, regional prevalence and dynamics of animal diseases and zoonoses at an early enough stage and to identify and coordinate the most effective actions at the regional level to minimise their spread and negative impact.

[10] https://agris.fao.org/agris-search/search.do?recordID=FR2013102681

[11] Zoonotic diseases are caused by pathogens that are maintained in animal populations and can be transmitted to humans under natural conditions. The complex interplay among human behaviour, animal reservoirs, vectors, the environment, and the pathogens themselves makes the recognition and control of zoonoses challenging. A variety of surveillance methods for zoonoses exist, including human disease surveillance, veterinary surveillance, sentinel animal surveillance, and laboratory-based surveillance. It is important to use a "One Health" approach of collaborative interagency and interdisciplinary partnerships to effectively address zoonoses.

[12] In January 2013, The Caribbean Public Health Agency (CARPHA) became the new single regional public health agency for the Caribbean. It combined the functions of five Caribbean Regional Health Institutes, including Caribbean Epidemiology Centre (CAREC).

The Example of African Swine Fever (ASF)

The recent introduction of ASF into the Caribbean region best demonstrates that any pest and disease can penetrate into and spread throughout CARICOM if they are not tracked and caught in time. This highlights the critical importance of having an early detection and rapid response system with a particular focus on environmental health surveillance.

In August of 2021, ASF was diagnosed in La Altagracia, the easternmost province of the Dominican Republic, and in the Barahona province in the south. The first case was confirmed in July 2021. However, the available information suggests that at the end of August 2021, the infection was confirmed in 18 out of 32 provinces of the country. At the end of August 2021, SPS authorities of Haiti reported the presence of ASF in domestic pigs on a farm with about 2,500 susceptible animals situated in the city of Anse-à-Pitre, which is located near the border with the Dominican Republic. The infection was confirmed in September 2021.

The ASF virus, which is unaffected by environmental factors, can survive in different environments and can live and replicate in *Ornithodoros* ticks from the Argasidae family without losing their virulence for up to 25 years after the elimination of the virus in the pig population. Since there is ample scientific evidence that *Ornithodoros* species are endemic in the Caribbean region (including the Dominican Republic and Haiti), it is clear that there is a need for targeted surveillance to quickly detect and respond to treats posed by the ASF virus not only in domestic and wild pigs, but also in arthropods and other elements of the environment that may serve as a source of the infection.

This example suggests that if CARICOM member states wish to improve the AHFS situation at the national level, the main precondition must be the establishment and operation of early detection and rapid response systems for pests and diseases at both national and regional levels. This must also be at the core of the regional AHFS policy.

3.3 KEY AHFS-RELATED HUMAN HEALTH CHALLENGES – FOODBORNE INFECTIONS AND INTOXICATIONS[13]

The foodborne infection situation in the region is dynamic. A study on foodborne illnesses (FBIs) conducted by CARPHA/CAREC in 2008, showed that the highest health burden in CARICOM member states was imposed by FBIs, most notably foodborne diseases (FBDs) caused by Norovirus, *Salmonella* spp. and *Shigella* spp. The study showed that non-typhoid *Salmonella* spp. was responsible for 47% of all reported

[13] Foodborne intoxication is caused by ingesting food containing toxins formed by bacteria which resulted from the bacterial growth in the food item.

FBDs and that Ciguatera toxin proved to be responsible for 24% of all reported foodborne poisonings (FBPs) respectively.

A wider range of pathogens causing FBIs in Caribbean countries was reported from 2010 onward. The data collected from WHO, PAHO, CARPHA/CAREC and other sources indicate that the spectrum of pathogens responsible for the occurrence of FBIs and acute gastroenteritis in the Caribbean includes *Escherichia coli* spp., *Salmonella* spp., *Campylobacter* spp., *Vibrio* spp., *Shigella* spp., *Giardia* spp., Norovirus, Rotavirus and biological toxins (i.e. ciguatoxin, maitotoxin, scaritoxin, etc. produced by harmful algal blooms and responsible for Ciguatera fish poisoning and neurotoxic shellfish poisoning in humans).

In 2020, CARPHA reported that in the Caribbean region, foodborne diseases continued to increase with huge impacts on public health and the economy. Thousands of people in the region experienced one or more episodes of foodborne illness annually. That means that every year roughly 1 in 49 persons in the Caribbean (approximately 142,000 persons) suffers from a foodborne illness, probably due to the consumption of contaminated food or drink**.** That number is increased to 1 in 11 persons during frequent mass gathering events, such as carnival, cricket, food festivals and holiday celebrations. Over 40% of these cases are children aged 1–4 years of age.

According to PAHO, of the 40 large outbreaks of foodborne infections, gastroenteritis-like symptoms and illness constituted the vast majority. It can therefore be assumed that a considerable proportion of FBIs in the Caribbean is accompanied by acute gastroenteritis, the estimated economic cost of which was USD 21M per year. This indicates the huge health and economic burden that gastroenteritis and foodborne diseases pose to the Caribbean.[14]

The incidence of FBDs in the Caribbean remains grossly under-diagnosed and under-reported. There is an urgent need to improve the surveillance of acute gastroenteritis and FBDs and implement appropriate and targeted food safety measures in countries of the region.

The regional challenge faced by the human and veterinary public health bodies, is to understand the sources, causes and regional prevalence of foodborne diseases and intoxications at an early enough stage and to identify and coordinate the most effective actions at the regional level to minimise their spread and negative impact.

3.4 KEY AHFS-RELATED ENVIRONMENTAL CHALLENGES – PESTS, DISEASES, CONTAMINATION

During the last decades, some countries of the Caribbean region have begun to deal more effectively with the management of health risks posed by industrial emissions and wastes, however, the progress made in this direction is limited and still leaves much to be desired in terms of an appropriate level of protection against these risks.

The Self Assessment conducted during the policy consultation pointed to informal or inadequate chemical residue monitoring, early detection and incident feedback mechanisms in the region. The results showed

[14] https://carpha.org/More/Media/Articles/ArticleID/334/Food-Safety-is-Everybody's-Business

'food chain residue monitoring" as having the worst score (defined as *"there is no monitoring of residues"*) and this is perceived to have gotten worse since 2016. Integration of resource management, which has become marginally worse since 2017, had the second worst score. Information sharing had the third worst score, described as *"not routinely shared"*. A small minority of responses indicated functional surveillance and response systems.

In addition to damage and losses caused by natural disasters, such as hurricanes and other extreme weather events, changes in weather and climatic patterns present a suitable environment for the proliferation of endemic pests[15] and diseases. In addition, there is an increasing threat of the emergence of new and more potent weeds, as well as arthropod and microbial pests.

In the CARIFORUM region, one of the most striking examples of the devastation caused by an infectious disease in an aquatic ecosystem, is the massive death of corals from a disease, which was diagnosed by specialists in 2015 as stony coral tissue loss disease (the so-called 'coral skittle-D disease'). It was one of the deadliest coral disease outbreaks on record. Fish and other food-producing aquatic animals traditionally provide an essential and irreplaceable components of the Caribbean diet, and their availability, sustainability and safety are dependent on the health of the aquatic ecosystem, which includes coral.

The meat obtained from fish and aquatic animals, which can be referred to as 'aquatic wildmeat', may carry risks to public health and VPH similar to those carried by meat of wild terrestrial animals.

Unfortunately, the surveillance and early detection of zoonotic pathogens in the environment and along the food chain has long been under-resourced in the region. The policy consultation responses in this respect indicated that where zoonotic monitoring is undertaken, in the majority of cases it is based on slaughterhouse inspections and sometimes without laboratory testing. There were several responses which indicated that an extensive programme of surveillance throughout the food and feed chains is needed, but they were a small minority.

Biological and chemical hazards that pose a threat to inhabitants of ecosystems in countries of the Caribbean region do not receive due attention from national and regional AHFS bodies. The threats include the effects of run-off on aquatic animal and plant health leading to bioaccumulation, antibiotic and hormonal medicine residues, and overuse of pesticides. The biodiversity of the region is among the richest on the planet but it is also among the most threatened by permanent loss due to development patterns.

Prioritising regional AHFS threats entails gathering and analysing data at the regional level, including data about the terrestrial and aquatic environments, which are sources of food and of risk to the food chain.

The regional challenge faced by all AHFS bodies is to understand the role played by the terrestrial and aquatic environment as a source of food and a vector of AHFS threats, and to identify and coordinate the most effective actions at the regional level to minimise their spread and mitigate their negative impact.

[15] Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant producthttps://www.ippc.int/largefiles/adopted_ISPMs_previousversions/en/ISPM_05_2007_En_2007-07-26.pdf

3.5 AGRI-FOOD TRADE

3.5.1 Agri-food trade context

The agri-food trade in the Caribbean region is variable and dynamic. The islands are mostly net importers of agri-food products, while the continental Caribbean countries of Belize, Guyana and Suriname, export more agri-food products than they import. Exports from these countries have increased strongly since 2000, while food imports into the islands have increased more than exports. Although the region is close to the markets of the United States of America and Canada, integration into these international trading systems is constrained by transportation problems, including low liner shipping connectivity and inefficiencies in port operations.

Historically, agricultural supply chains and trade in the region were heavily targeted towards export to the European Union (EU). Reforms of EU trade policies caused a dramatic decline in the export demand for sugar and bananas from the region, resulting in a more diversified trade structure. Traditional exports, which include sugar, bananas and basic agricultural commodities have declined from 60 percent of agri-food exports in the early 1990s to less than 20 percent in 2019. The main growth area has been exports of processed foods, including beverages, which increased from 10–15 percent to around 50 percent of agri-food exports. This transformation has been strongest in the island economies and less so in the continental countries. [16]

3.5.2 EU - CARIFORUM agri-food trade

According to the 2020 assessment of the impact of the EU-CARIFORUM Economic Partnership Agreement (EPA) [17], in 2018 CARIFORUM exports to the EU stood at €3.9bn (USD4.7bn) while exports from the EU were €5.1bn (USD6.1bn). The EU, which had a negative trade balance with CARIFORUM at the start of the agreement of €280 million, had a trade surplus of €1.2bn (USD1.5bn) in 2020. Trade in goods between CARIFORUM and the EU is mostly concentrated in the Dominican Republic (32%), Trinidad and Tobago (25%), the Bahamas (16%) and Jamaica (8%).

The assessment reported that CARIFORUM exports to the EU fluctuated over the past decade but, on average, they were lower in the past five years than they were in the five years before the EPA came into place in 2008. However, this does not apply across all CARIFORUM countries, as country-level trends show varied results. Over the past decade, exports have strongly increased for Antigua and Barbuda, Belize, the Dominican Republic, Grenada and Guyana. In the case of Barbados, Jamaica, and Saint Kitts and Nevis, exports increased to an extent. Exports across the Bahamas, Dominica and Suriname decreased somewhat, while there was a sharp decline for Trinidad and Tobago, Saint Lucia, and Saint Vincent and the Grenadines. Drops in exports, which were particularly strong in 2016 for some countries, coincided with the drop in international energy prices[18].

The 2020 assessment stated that, *"the total value traded in 2018 was practically the same as the total trade in 2008 at €9.5bn"*. It also noted that the average annual growth rate of CARIFORUM exports to the

[16] Food and Agriculture Organization of the United Nations Santiago, 2019 http://www.fao.org/3/ca5527en/ca5527en.pdf

[17] https://trade.ec.europa.eu/doclib/docs/2020/february/tradoc_158657.pdf

[18] https://trade.ec.europa.eu/doclib/docs/2020/february/tradoc_158657.pdf

EU for the decade after the implementation of the EPA was just 2%, while EU exports to CARIFORUM rose by 4%. In 2007, 18% of CARIFORUM imports came from the EU; by 2018 this had fallen to 12%.[19]

It is important to bear in mind that whilst these headline statistics may not be encouraging, it is possible that disaggregated analyses may reveal relative progress in specific subsectors.

3.5.3 Aid for Trade[20]

The above situation in respect of EU-CARIFORUM trade is observed despite the fact that support provided by the EU to CARICOM over the past three decades has been Aid for Trade as opposed to the selective, targeted aid-for-health. This emphasis is explained by the fact that relations between the Caribbean and European communities were initially built on the trade framework from which other frameworks were subsequently derived.

Although trade with CARICOM accounts for only a small share in the EU trade, it is important to the EU from a geopolitical perspective, because the Dutch and French (in the past also British) overseas countries and territories are part of the Caribbean region.

The EU began trade-related dialogue with CARICOM and continued with CARIFORUM. Trade relations between the EU were governed by the Cotonou Agreement, which entered into force in 2000 to replace the Lomé Convention of 1975. These offered ACP group of states an opportunity to negotiate and sign a partnership agreement with the EU. CARIFORUM-EU negotiations on the EPA began in 2004 and in 2008, a signed EU-CARIFORUM EPA entered into force.

A 2014 review on the progress in the implementation of the EU-CARIFORUM EPA in 2008–2013 found a number of shortcomings in different dimensions of cooperation [21, 22]. The SPS component of the EPA was found to lack strategic policies for investment and development cooperation that would ensure that agri-food products produced in CARIFORUM were compliant with the health, safety and quality standards of the EU. Under Chapter 7 of the EPA, parties were committed to establishing harmonised intra-regional SPS measures and to designate authorities that will be responsible for ensuring the harmonisation of these measures in terms of their equivalence and compliance with respective prescriptions of the SPS Agreement and international SPS standards established by the IPPC, OIE and CAC.

The review, however, does not contain any information about the extent to which CARIFORUM-EU intra-regional SPS measures were harmonised (including the level of equivalence and compliance with international SPS standards), or about the impact of these measures on AHFS and public health in CARIFORUM and EU member states over the period under review. The absence of this information is critical, especially against the backdrop of a progressively aggravating epidemiological situation with FBIs in the Caribbean region. Throughout the first decade of the 2000s, certain FBDs and FBPs had already

[19] https://www.caribbean-council.org/eu-cariforum-epa-has-done-little-to-increase-caribbean-trade/

[20] Aid for Trade is about helping developing countries, in particular the least developed, to build the trade capacity and infrastructure they need to benefit from trade opening. It is part of overall Official Development Assistance (ODA) — grants and concessional loans — targeted at trade-related programmes and projects.

[21] Five-year review of the CARIFORUM-EU EPA, joint working document, CARIFORUM/EU, 2015

[22] The parties have now concluded the negotiations for a new treaty that will replace the Cotonou agreement. The new Partnership Agreement between the European Union and members of the Organisation of African, Caribbean and Pacific States (OACPS, formerly known as the ACP Group of States) marks the formal conclusion of the negotiations of the Post-Cotonou Agreement, setting the political, economic and sectorial cooperation framework for the next twenty years.

became a scourge for Caribbean public health authorities and today are the main issue of concern for CARIFORUM governments in the AHFS area, primarily due to their adverse impact on the tourism industry.

Whilst compliance with WTO and EPA SPS requirements will be ensured to optimise intra-regional and international trade, this AHFS policy aims at ensuring the appropriate level of protection of human, plant, animal and environmental health for the citizens of and visitors to the CARIFORUM region.

3.6 LACK OF DATA GATHERING CAPACITY PROCESSING FOR STRATEGIC AND OPERATIONAL PURPOSES

According to the responses given in the regional policy consultation exercise, *"data collection and exchange"* was described by a majority of respondents as occurring on *"an ad hoc basis"* and many respondents selected the option there were *"no systematic gathering and use of scientific inputs into policy and delivery"*.

Epidemiological data is being collected under regional public health initiatives implemented by PAHO and CARPHA, but much of the data gathered is focused on surveillance, detection and identification of FBIs. These incidents are attributed to the consumption of unsafe agricultural and food products, rather than on an investigation of these incidents and their traceability backwards to determine where they come from and why these unsafe products were placed on the market for human consumption [23, 24, 25].

Foodborne illnesses continue to be an important global public health problem. Surveillance is essential in efforts to measure, control, and prevent foodborne infections and intoxications. Capacity is increased with the increasing complexity of the surveillance system, which can be classified on a spectrum ranging from no formal surveillance to syndromic surveillance, laboratory-based surveillance and, finally, integrated food-chain surveillance. While syndromic surveillance is usually not specific enough for most appropriate surveillance needs, it may be useful in countries with insufficient resources to establish laboratory-based surveillance[26].

AHFS initiatives cannot effectively address regional AHFS threats without ensuring that the pre-conditions for the detection and identification of endemic health threats are in place regionally, across all health-related sectors and their crosscutting spheres. These include plant, animal, VPH, and environmental health. The relevant decision makers and operational planners require reliable and quality data to correctly assess the risks and for decision making on the design and application of AHFS measures. It is clear from stakeholders' responses to the policy consultation questionnaire and from other discussions that there is an expectation and hope that CAHFSA will play a lead role in ensuring the success and sustainability of such a vital initiative.

The assessment of the Implementation of the EPA - Challenges and Bottlenecks in the CARIFORUM Region states that, *"an overriding problem for all member states is the lack of resources, both human and*

---

[23] S. Pires, A. Vieira, E. Perez, D. Lo Fo Wong , T. Hald «Attributing human foodborne illness to food sources and water in Latin America and the Caribbean using data from outbreak investigations», International Journal of Food Microbiology, 2012

[24] L. Indar, L. Francis, S. Quesnel, E. Bissessarsingh, O. Olowokure «Foodborne diseases in the Caribbean, 2005–2014: changing epidemiology and implications for prevention and control», Program and Abstracts Book of the International Conference on Emerging Infectious Diseases, 2015.

[25] L. Indar «Enhancing early warning and response to travel related foodborne diseases and other public health issues occurring in stay over (hotels) and cruise ship visitors», CARPHA/CHTA/CTO, Communication in CARPHA Regional Foodborne Diseases Surveillance and Food Safety Workshop. 2015

[26] Surveillance for foodborne diseases https://onlinelibrary.wiley.com/doi/10.1002/9781118543504.ch9

financial" and that, *"SPS regimes should be prioritized"*[27]. The limited resources available can only be properly utilised if regional surveillance and data collection mechanisms are in place and operational, and the collected data is used in the assessment of threats and the design of measures to address these hazards.

Therefore, AHFS data collection, processing and utilisation to enable rational risk-based decision making will be a key focus of this policy.

The policy will focus on regional surveillance, AHFS data collection, processing and utilisation to properly assessment threats and enable rational risk-based decision making in designing mitigation measures.

3.7 LACK OF SUSTAINABILITY AND REPLICATION OF PROGRESS AND SUCCESSES

There have been many positive regional AHFS initiatives over the decades. These include those from the Caribbean Animal and Plant Health Information Network (CARAPHIN), the Caribbean Pest Diagnostic Network database and the CIRAD surveillance network; with IICA leading the drive for the development of regional AHFS data gathering and usage.

There have also been many success stories in identifying and addressing specific AHFS threats. These, in turn, have positively influenced the development of the agri-food trade with the EU and other high value markets. Considerable effort and progress have been made to strengthen the legislation, coordination and regulatory mechanisms of the 15 CARIFORUM states to align them with international requirements and best practice.

The unfortunate reality is that many of the successes achieved could not be sustained in the long term and many of the promising initiatives were unable to continue after the termination of external support (e.g. from projects).

4. THE SCOPE OF AHFS FOR THIS POLICY

The definition of the scope of AHFS, and accordingly of this policy, is of key importance to its success. The scope of the policy is targeted to address regional AHFS systemic issues and what is needed to deal with the most important regional challenges. This includes the mechanisms to gather and use data covering all potential sources of threats to the health of regional human, animal and plant populations, including environmental threats. It will be dynamic, based on current modern AHFS approaches and best practice, and will be kept under review and amended based on global developments and the recommendations of relevant international bodies.

[27] Humphrey, E. 2011. Implementing the Economic Partnership Agreement: Challenges and Bottlenecks in the CARIFORUM region. (ECDPM Discussion Paper 117). Maastricht: ECDPM

4.1 THE CONCEPT OF VETERINARY PUBLIC HEALTH (VPH) AND IMPORTANCE OF ZOONOSES

In 1999, the WHO, FAO and OIE convened a meeting in Teramo, Italy, to establish an internationally accepted definition of VPH and to discuss emerging and re-emerging VPH issues. The resulting definition of VPH was, *"the contributions to the physical, mental and social well-being of humans through an understanding and application of veterinary science"* to replace the previous definition, *"a component of public health activities devoted to the application of professional veterinary skills, knowledge and resources to the protection and improvement of human health"*.

Up to the early 1990s, VPH control remained neglected in many developing and least developed countries, which was manifested in outbreaks and epidemics of diarrheal diseases of a zoonotic nature. The inability of the national public health authorities to localise these outbreaks and failure to prevent their regional spread, highlighted the importance of VPH as an essential component of public health. It also raised concerns over the ability of WHO's International Health Regulations to prevent and manage the international spread of anthroponotic and zoonotic infections. This forced the WHO to revise these regulations.

In the early 2000s, the FAO, OIE and WHO collected enough scientific evidence to state that more than 60% of the known infectious diseases and 75% of the emerging infectious diseases that affect people are zoonotic. Epidemiological information collected by Global Salm-Surv (which in 2009 was renamed the Global Foodborne Infections Network) and other global and regional information systems indicated an interconnection between infectious diseases in humans and in animals. This laid a foundation for a renewed VPH concept based on collaborative surveillance, early detection and neutralisation of zoonotic pathogens in the environment and along the food chain.

The concept of VPH is explicitly included in the scope of the term 'AHFS for the purpose of this policy.

4.2 IMPORTANT RISKS CURRENTLY NOT THE FOCUS OF CARIFORUM AHFS SERVICES

The Caribbean has historically depended on its natural resources for economic growth. The well-being of the regional environments is therefore of paramount importance. The available information suggests that about 70% of the population of Caribbean nations rely on their coasts for a large percentage of economic activity[28], which in turn depends on the state of marine and coastal ecosystems and diversity of its inhabitants.

The region's geographical expanse and climate have produced a wide range of inland ecosystems that support diverse fauna in freshwater sites, such as rivers, lakes and underground karst networks. In addition to providing habitats for unique terrestrial and aquatic animal species (both, endemic and migratory), these freshwater sites serve as a source of clean, potable water that is also used for the production of food and hydroelectricity in communities. These freshwater sites are especially important

[28] https://www.worldbank.org/en/news/feature/2014/09/05/can-you-imagine-a-caribbean-minus-its-beaches-climate-change-sids

for small island communities, which are surrounded by salt water, and therefore largely rely on limited, land-based fresh water from functional ecosystems[29].

4.2.1 Risk to aquatic environments

National and regional AHFS bodies do not give adequate attention to the biological and chemical hazards that pose a threat to inhabitants of Caribbean ecosystems. The biodiversity of the region is among the richest on the planet. However, the evidence suggests patterns of urbanisation, industrialisation and mechanisation are irreversibly transforming ecosystems and threatening the health of inhabitants. According to the WHO, around one fifth of the total disease burden in the Caribbean can be attributed to the modifiable environment[30].

In recent years, countries in this region achieved varying degrees of success in their efforts towards protecting environmental health but many problems are still far from being solved and some of them are growing. These include the deterioration of coastal ecosystems as well as chemical and biological hazards that affect the health of aquatic animals.

Over the past decades, Caribbean marine and other aquatic environments have been experiencing increasingly stressful conditions due to a combination of abiotic, biotic and anthropogenic factors. These led to problems with environmental health in general and that of aquatic animals in particular. One such problem, which is common across the region, is the death of different aquatic animal species, the causes of which remain unidentified. Establishing official mechanisms to manage the health of aquatic animals with inadequate implementation is a challenge faced by many countries of the region.

The lack of available data and limited reporting of causes and remedial measures indicates that from time to time, the mass death of aquatic animal species occurs in marine and other aquatic environments of this region[31] but these remain without due response from relevant national and regional bodies. Early reporting indicated that, *"all investigations and collections were seriously delayed because of confusion over who should study what and what agencies should examine the samples"*[32] and there is no evidence that these problems have since been addressed. A 2019 report of the World Bank points out that, *"the Caribbean has a paucity of quality-assured environmental data about its waters, because only a few countries have the necessary systems in place to collect them … Governance of the marine environment and coordination between Small Island Developing States in the region remain fragmented, with poor integration of environmental considerations into regional development planning and a lack of integrated management of the marine environment."*[33]

---

[29] Caribbean Islands Biodiversity Hotspot: Ecosystem Profile Summary, Critical Ecosystem Partnership Fund, 2009.

[30] M. R. PeriagoI, L. A. GalvãoII, C. Corvalán, J. Finkelman "Environmental Health In Latin America And The Caribbean: at the crossroads", Saúde Soc. São Paulo, v.16, n.3, p.20–25, 2007

[31] *https://www.jstor.org/stable/2097159*

https://aquadocs.org/handle/1834/29398

http://www.vliz.be/imisdocs/publications/156539.pdf

https://www.redalyc.org/journal/6337/633766163002/html/

[32] http://www.globalcoral.org/_oldgcra/85%20Mass%20Mortalities%20Caribbean.pdf

[33]https://documents1.worldbank.org/curated/en/482391554225185720/pdf/Marine-Pollution-in-the-Caribbean-Not-a-Minute-to-Waste.pdf

4.2.2 Risk of aquatic ecosystems and aquatic animals

The disease situation in aquaculture is changing rapidly but the progression is very difficult to predict due to the current period of accelerated change in the international trading environment. This is affected by globalisation, increasing aquaculture production, microbial adaptation and climate change. Diseases in aquatic ecosystems and aquatic animals pose a threat to the human, animal and plant health of the region and has been a primary constraint to the culture of many aquatic species. This has impeded both economic and social development in many countries.

Disease is a major limiting factor for successful aquaculture production, with lasting effects on socio-economic development in many countries. Country-level impacts of a significant disease can be estimated indirectly through losses in levels of income, production, employment, international trade, investments and consumer confidence. In countries for which data is available, economic losses from decreased production and exports caused by acute hepatopancreatic necrosis disease was USD12 billion in Thailand (2010–2017 period) and greater than USD26 million in Viet Nam (2015).

In this age of uncertainty over food security due to the negative impacts of diseases, the use and application of 'surveillance' and 'reporting' has become very timely. The sustainability of the sector will be compromised if challenges posed by exotic, endemic and emerging diseases of aquatic organisms are not tackled in a responsible and efficient manner.

Surveillance is a systematic process of gathering information about the occurrence of important diseases and pathogens in order to produce meaningful reports on the disease status of a farm, zone, country or region. Surveillance will thus support import risk analysis, justify import health certification requirements, and enable export health certification by providing evidence to substantiate claims of the absence of a particular disease.[34] One of the examples is communicable disease, which have threatened coral reef communities across the Caribbean region over the past decades. The impact of these diseases on coral reefs in different parts of the Caribbean Sea is yet to be studied, but it is known that their spectrum is wide and includes white plague, white pox, yellow band disease, black band disease and dark spot disease.

Information about the incidence and prevalence of these diseases is very limited, which makes it difficult to assess or predict their potential effects on environmental health. Corals and some other animal species, such as reptiles, are still not recognised as aquatic animals by the OIE. However, the available information suggests that epizootics of communicable diseases in corals does not only cause a deterioration of their communities but may also result in mass death and extinction of certain animal species like fish, crustaceans and molluscs. These live in or feed from these communities and therefore play an important role in the maintenance of the marine ecosystem and are defined by the OIE as aquatic animals.[35]

Another concern is associated with the occurrence (or re-occurrence) and spread of animal diseases including transboundary animal diseases and zoonotic diseases in populations of marine animals and birds. Examples include dinoflagellatosis of crustaceans, fibropapillomatosis of sea turtles, HPAI of migratory sea birds, as well as a number of communicable diseases in molluscs and fish. There is a lack of

[34] Surveillance of diseases of aquatic organisms: a novel approach to assist multidisciplinary teams in developing countries https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12530#raq12530-bib-0022

[35] Note - in all (including latest) versions of OIE Aquatic Animal Health Code, aquatic animals defined as "all life stages (including eggs and gametes) of fish, molluscs, crustaceans and amphibians originating from aquaculture establishments or removed from the wild, for farming purposes, for release into environment, for human consumption or for ornamental purposes". Corals and reptiles are not defined under the term "aquatic animals", which leaves these species beyond national and regional programmes and projects focused aimed at protecting aquatic animal health.

qualitative and quantitative data on areas such as the ethology, pathology, and spatial and temporal variability in the incidence of these and other infections that affect animals living in aquatic or associate ecosystem. This makes it very difficult to determine their direct and indirect impact on health and sectors of the economy at national and regional levels.

Mortality in aquatic animals caused by some pathogens can be widespread, damaging environmental sustainability and destroying ecosystems as well as the economies of coastal communities, resorts and related businesses. Increasing maritime trade and new routes have led to an increased potential for collisions, spills and contamination, including oil and ballast water containing pathogens, which can negatively affect the marine and onshore environment. Examples include mass die-off of the long-spined sea urchin caused by an unknown pathogen, and infection of Caribbean spiny lobster from *Panulirus argus* Virus 1 (PaV1) virus.

4.2.3 The health risk of wild animals[36]

AHFS issues associated with the health of wild animals are under-considered in almost all countries of the Caribbean region. Many animal diseases, including transboundary animal diseases (TADs) and zoonotic diseases, may persist in captive and wild species as well as in wildlife. Examples of wild species that can serve as potential hosts, carriers and shedders of animal diseases enzootic in this part of the world include wild birds for HPAI and wild hogs for Classical swine fever.

The lack of surveillance of zoonotic diseases in wild animals is a particularly important omission, as 'bushmeat' is a part of the human diet in a number of countries of this part of the world. The consumption of bushmeat by some ethno-cultural and social groups of the population is fraught with infection by different zoonotic pathogens that circulate in populations of wild animals[37,38,39,40]. Examples include *Salmonella spp*., *Campylobacter spp*., *Escherichia spp., Taenia spp.*, and a number of other zoonotic pathogens that have been found in green iguanas, blue land crabs and other wild species.

There is evidence that the wildlife in the Caribbean region can be a source of infection for domestic animals with diseases, including TADs and zoonotic diseases, and that bushmeat can be a source of human infection with zoonotic diseases and FBIs. However, there are no specific studies attempting to correlate rates of infections in wild animals with those in domestic ones or with contamination of bushmeat. Additionally, there are no activities aimed at surveillance and early detection of pathogens in products and by-products used for different purposes that are derived from wild animals. The problem is compounded by the illegal trade and entry of bushmeat into the islands, across national borders.

---

[36] *The OIE defines wild animal as "an animal that has a phenotype unaffected by human selection and lives independent of direct human supervision or control"* - 'living in the natural environment i.e. not domesticated'.

[37] C. Nkogwe, J. Raletobana, A. Stewart-Johnson, S. Suepaul, A. Adesiyun "Frequency of Detection of Escherichia coli, Salmonella spp., and Campylobacter spp. in the Faeces of Wild Rats (Rattus spp.) in Trinidad and Tobago", Veterinary Medicine International, 2011, Apr 12:686923.

[38] V.A. Amadi, R. Peterson, V. Matthew-Belmar, R. Sharma, H. Hariharan "Prevalence and antibiotic susceptibility of gram-negative aerobic bacteria cultures form the intestine and hepatopancreas of blue land crab (Cardisoma guanhumi) in Grenada, West Indies". British Microbiology Research Journal. 2015/5(2), pp. 169-179.

[39] W.R. Sylvester, V. Amadi, R. Pinckney, C.N. Macpherson, J. S. McKibben, R. Bruhl-Day, R. Johnson, H. Hariharan "Prevalence, serovars and antimicrobial susceptibility of Salmonella spp. from wild and domestic green iguanas (Iguana iguana) in Grenada, West Indies", Zoonoses Public Health. 2014/ 61(6), pp. 436-441.

[40] M. Drake, V. Amadi, U. Zieger, R. Johnson, H. Hariharan "Prevalence of Salmonella spp. in cane toads (Bufo marinus) from Grenada, West Indies, and their antimicrobial susceptibility", Zoonoses Public Health. 2013/60(6) pp. 437-441.

Among the risks that are currently neglected by national and regional AHFS bodies in the Caribbean region are those posed by certain vector-borne animal diseases (e.g. Blue Tongue Disease, babesiosis and anaplasmosis) and zoonotic diseases (e.g. heartwater, leishmaniasis, West Nile and encephalitis). These are of special concern. The transmission cycles of vector-borne diseases in the region are maintained mainly by populations of rodents, insects and ticks, with spill-over into animals and humans, causing further cross-infection.

These transmission cycles are influenced by general environmental factors, such as spectrum-reservoirs hosts and the availability of suitable habitat for vectors, and can be transformed by specific abiotic and biotic factors. This complicates surveillance, control, elimination and prevention of vector-borne diseases[41]. Abiotic factors include changes in temperature and humidity, natural disasters, and limits on the carrying capacity of habitats to support vectors and reservoir hosts. Examples of biotic factors are changes in the competence and capability of primary vectors, interactions between primary and secondary vectors and the adaptability of pathogens to secondary vectors.

Due to the importance of the terrestrial and aquatic environment as a source of food and the risk to the health and economic wellbeing of Caribbean citizens and visitors, it is essential that it be explicitly included in the concept of AHFS being addressed by this policy.

4.2.4 AHFS and Foodborne Illnesses (FBIs)

During the period 2010 to 2020, governments of CARIFORUM member states repeatedly expressed their concerns over the epidemiological situation with FBIs. This was largely due to the burden of certain foodborne diseases (FBDs) and foodborne poisonings (FBPs) on the health and economy of the Caribbean.

The economic cost of acute gastroenteritis, which is the major disease associated with FBDs and FBPs, was estimated at USD21 million per year, while pathogens that are among the causative agents of FBIs like Norovirus, Salmonella, Campylobacter and Shigella, and Ciguatera toxin, together contributed USD40.4 million to the overall annual economic costs of acute gastroenteritis.

Very little information was available in relation to the incidence, prevalence, and patterns of FBIs endemic in CARICOM member states. This includes information on attributable sources of the causative agents in the environment and food chain, points of their penetration from the environment into the food chain and transmission pathways. The epidemiological data being collected by PAHO and CARPHA focusses on the surveillance, detection and identification of FBIs in relation to the consumption of unsafe agricultural and food products. Investigations do not extend to determining the origins of these incidents and how unsafe food items were paced on the market.

[41] Vector competence refers to the genetic factors (usually heritable) that enable a vector to transmit a disease, while vector capability is a wider concept which includes environmental factors that influence the ability of the vector to transmit a pathogen (e.g. population densities of vector and host and/or changes in temperature and humidity). This presents another problem posed by adaptability of pathogens. One example is the spread of bluetongue disease (BTD) to northern Europe, where its main vector, flies *Culicoides imicola* is not present. It was confirmed that this unexpected change in geographic distribution was due to a switch from its primary vector *Culicoides imicola* to secondary vectors, other *Culicoides spp*., which adapted to the cold climate of northern Europe (Maclachlan N.J., Mayo C.E., Daniels P.W. & Gibbs E.P.J. "Bluetongue. In New developments in major vectorborne diseases" Revue scientifique et technique, 2015, Vol. 34/2).

In examining practices and programmes of the prevailing AHFS approach in the region, a consistent and challenging feature is a tendency to address AHFS and FBIs separately and by sector. This is demonstrated by initiatives to address the FBI threat by strengthening official food safety controls over the production, import and distribution of ready-to-eat and ready-to-cook foods rather than on addressing the control issues at the source and throughout the food chain.

The current structures of AHFS systems in some member states should be modernised into an integrated and comprehensive entire food chain approach, to allow for a more effective mechanism to address FBIs in the region. This requires difficult systemic changes but is more efficient and sustainable in the long run.

In many CARIFORUM member states, the responsibility for managing the risk of foodborne illnesses is assigned to public health authorities and therefore deal mainly with the consequences of incidents. Several initiatives by national authorities towards addressing issues of AHFS and public health, including problems with FBIs, were undertaken in isolation from each other. These initiatives were with as well as without support from specialised regional bodies and international development partners.

To strengthen the AHFS policy framework in the Caribbean there is a need to focus on and target efforts at the critical links between agriculture and health and to strengthen official AHFS controls over these links accordingly.

It is well-established that the causes of natural death in plants, animals and humans are being affected by a number of social and environmental health determinants. Environmental health determinants are of greater importance when it comes to diseases in humans, animals and plants due to their exposure to hazardous chemical and biological substances. Having reliable and accurate information about the persistence and circulation of these substances in the food chain and the environment is of vital importance for establishing and maintaining an appropriate level of protection of AHFS and public health for each territory.

Ciguatera poisoning (CP) is the most prevalent, phycotoxin-related seafood poisoning across the globe, affecting between 10,000 and 50,000 people annually. An analysis of the time-series data available for a limited number of countries indicates the highest incidence rates are consistently reported from two historical Ciguatera -endemic area: the Pacific and the Caribbean regions. This situation is due, in part, to the strong reliance of local communities on marine resources. This illness results from the consumption of seafood contaminated with lipid-soluble toxins known as ciguatoxins, which are produced by benthic dinoflagellates in the genera *Gambierdiscus* and *Fukuyoa*. Ciguatera prevalence is significantly underestimated due to a lack of recognition of Ciguatera symptoms, the limited collection of epidemiological data on a global level, and reticence to report the illness in Ciguatera-endemic regions.[42]

Pathogens responsible for infections or intoxication of animals and humans are among the most important environmental determinants of health and those that can be transmitted from animals to humans and vice versa are of particular importance. These Zoonotic pathogens have the potential to cause severe infection and intoxication of animals and humans and can also contaminate food, feed, water and elements of the environment, thereby turning them into a sources of further infection and intoxication.

[42] https://pubmed.ncbi.nlm.nih.gov/33875186/

Although, governments of nearly all Caribbean countries encourage and support the local production of agricultural and food products for import substitution, many of these countries remain net importers of foods. The import of food remains critical to the nutritional and stability dimensions of food security and an important source of employment-based, income-earning opportunities, particularly in small tourism-dependent economies.

The smaller the tourism-dependent economy, the more limited is its capacity to meet the domestic demand for agricultural and food products through domestic production, and the more open it must be to the importation of agricultural and food products to ensure food security and in support of the tourism industry. However, a protracted unfavourable AHFS situation, resulting from frequent natural disasters and inadequate official AHFS controls, does not allow the national food systems of many Caribbean countries to develop and to support economic diversification through increases in local production and exports of agricultural and food products.

The interrelatedness and interdependence of agricultural health and FBIs (including the limited coordination and feedback mechanisms between institutions responsible for animal health and human health) is a key focus of this policy.

5. THE WAY FORWARD

With the current political will and institutional arrangements at the regional level in place, the time is right to move forward on these important issues. CAHFSA is mandated to perform a coordinating and organizing role for the establishment of an effective and efficient regional AHFS regime and to execute on behalf of member states, such AHFS actions and activities that can be more effectively and efficiently executed through a regional mechanism[43]. The Agricultural Health and Food Safety Systems (AHFSS) Thematic Group will continue its work in supporting and guiding the initiatives in this area as well as in the implementation of this policy.

[43] https://www.cahfsa.org/about-us/mandate

SECTION 2

Policy Elements

6. STRATEGIC GOAL, SPECIFIC OBJECTIVES AND OUTCOME

Strategic goal

This policy will contribute to the overall strategic goal of enhancing the regional AHFS system to achieve the appropriate level of protection of human and animal health and life, as well as plant, veterinary, public and environmental health, improved food and nutrition security, and optimum facilitation of intra-regional and international agri-food trade.

Specific Objectives of this policy

- To enhance the early detection of and timely response to regional AHFS threats through regional cooperation, and the coordination of measures and actions in an integrated and comprehensive way along the entire food chain.
- To improve regional AHFS decision making through targeted gathering, analysis and use of data and science-based governance.
- To promote the use of modern approaches and technologies in the assessment and management of regional AHFS risks.
- To ensure the sustainability of human and animal health and plant life and environmental health in the region.

Outcome

Regional AHFS risk assessment, communication and management along the food chain are enhanced by ensuring data-sharing and science-based governance; that decisions are in line with international standards and best practice; and by using modern approaches and technology to gather, process and disseminate human, plant, animal, veterinary public and environmental health intelligence and data.

Steps in a long-term strategic process

This Policy and its Action Plan are part of a long-term strategic process to optimise the regional and member state national AHFS systems. The specific objectives of this regional policy are defined so as to realistically and practically address the key regional systemic issues and optimise the current national and regional capacity. As the national capacities of member states are enhanced in line with the AHFS Self-assessment tool, and as the outcome of this Policy and Action Plan is achieved, so can the next phase of the regional strategy be defined and implemented accordingly.

7. APPROACH AND PRINCIPLES

The following approach and principles will guide the design and implementation of the policy.

7.1 APPROACH

The comprehensive and integrated food chain approach will ensure that the linkages and interdependence of the various AHFS elements (including environmental health and VPH) are considered at every stage of planning and implementation and that it represents a recognised modern science-based,

WTO-compliant approach used by one of the major trading partners. An example of this is the EU Farm to Fork Approach[44], which is used as a benchmark by many major agri-food trading economies. The proposed approach is fully in line with and reinforces the WHO, FAO, OIE One Health[45] concept.

7.2 PRINCIPLES

The principles guiding the design and implementation of this policy include:

- The establishment and maintenance of the appropriate level of protection (ALOP) will be achieved by relying on science- and risk-based requirements and decision making whilst ensuring compliance with all international obligations.
- The Farm[46] to fork principle will ensure that the entire food chain is considered when identifying and addressing threats to human, animal, plant and environmental health.
- Traceability will ensure that the source of a threat can be identified, wherever it is along the food chain, and establish primary responsibility and accountability.
- Transparency will be achieved through the publication and availability of all applicable regulations to all stakeholders and participants of the agri-food market.
- Sustainability will be built into all interventions from the outset, so that outcomes will endure long after any external support.
- All interventions will be targeted and focused to ensure that they are realistic and achievable with the available resources.
- Harmonisation with global and regional best practice and standards will ensure compatibility and integration into the world agri-food trading system.
- Inclusiveness will ensure the involvement of all relevant stakeholders, including public-private sector partnerships.
- Collaboration will be enhanced through a participatory approach.
- Risk-based and data driven decision making will ensure rational and WTO-compliant outcomes.
- Leadership in joint task-based planning will be preferred to pure institutional responsibility.
- Subsidiarity will ensure that regional agencies will only perform those tasks which cannot be more effectively achieved by individual members.
- Effectiveness will be achieved though clear, task-based needs identification, planning and resource allocation.
- Efficiency will be achieved by optimisation and rationalisation of limited resources through modern management and technology.
- Cooperation and coordination will be achieved through clarification of common purpose, consensus and task-based responsibilities and enhanced communication mechanisms.
- An integrated and comprehensive approach along the entire food chain will be ensured by focusing on systems and processes and viewing agri-food production, processing and distribution as a seamless continuum.

[44] https://ec.europa.eu/food/system/files/2016-12/fs_infograph_from-farm-to-fork_en.pdf

[45] One Health is a collaborative, multisectoral, and trans-disciplinary approach - working at local, regional, national, and global levels - to achieve optimal health and well-being outcomes recognizing the interconnections between people, animals, plants and their shared environment. https://www.onehealthcommission.org/en/why_one_health/what_is_one_health/

[46] The farm in this sense extends to include the aquatic and terrestrial environment as a source of food and source of risk to the food chain.

- Optimum facilitation of regional and international agri-food trade will be ensured by compliance with international and regional standards and best practices production, processing logistics and in border systems and procedures.

7.3 LESSONS LEARNED FROM PREVIOUS INTERVENTIONS

There have been multiple interventions in the area of SPS and AHFS over the years, some of the successes and failings of which are discussed in the annexed situational analysis. In 2000, IICA conducted an analysis of the general capacity of the national AHFS services of 31 developing countries of the Americas and produced an aid-for-trade case study on ***Strengthening national agricultural health and food safety services via the application of IICA´s Performance, Vision and Strategy (PVS) tool***.[47]

The tool is meant to serve as a model for member states to guide adjustments in their national AHFS services and systems, as a means of successfully meeting the challenges of globalisation. Its pilot use led to the realisation of the need to develop and use a tool aimed at promoting the continual improvement of the official AHFS service; one that was dynamic, simple and easy to use, so that officials in the service could periodically apply it themselves to monitor such improvement.[48]

Amongst other considerations, this led to the development of the Self-assessment tool within the framework of the 'Development of a Regional Coordination Mechanism for Agricultural Health and Food Safety Systems in the CARIFORUM Region'[49]. This not only provided an insight into the current status of AHFS system development, but also presented a phased (five-stage) roadmap for future improvement of the component elements of the system.

This project also identified the need *"to develop a work plan...including coordination (gathering and use) of scientific inputs into policy and delivery, coordination of laboratory testing resources, coordination of agri-food safety incident feedback and rapid alert, and coordination of export control system audits"*.

*The key lesson learned from the assessment of previous interventions is that only a broad **region-specific systemic approach** in viewing the current AHFS challenges and their solutions will result in sustainable improvement in effectiveness and efficiency and the achievement of the policy objectives.*

[47] http://repiica.iica.int/DOCS/B0744I/B0744I.PDF Not to be confused with the OIE PVS - OIE Tool for the Evaluation of Performance of Veterinary Services as for example undertaken in Belize in 2010 and 2014 https://www.oie.int/app/uploads/2021/03/gapanalysisreport-belize.pdf

[48] https://www.oecd.org/aidfortrade/48181835.pdf

[49] Support to the Caribbean Forum of ACP States in the Implementation of Commitments Undertaken Under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS) Project CaRC/BB/SPS-EOICN01/15

8. ACTIONS

The following are the key actions required in order to achieve the specific objectives of this policy. These are further specified and scheduled in the annexed ***Action Plan***.

- Assess and allocate responsibility to a suitable regional structure (e.g. AHFSS Thematic Group) to fully integrate VPH and environmental (aquatic[50] and terrestrial) health into AHFS and initiate and manage The Caribbean AHFS Early Detection and Response System (CAEDRS).
- Conduct an initial inventory of AHFS threats in the Caribbean region with a categorisation of threats and delineation of priority threats in the fields of plant health, animal health (animal and zoonotic diseases, including TADs), veterinary public health (zoonotic diseases, foodborne infections and intoxications) and environmental health (terrestrial and marine wildlife).
- Create, under the supervision of CAHFSA, a web-based data sharing network, the Caribbean AHFS Early Detection and Response System (CAEDRS).
- Designate national CAEDRS contact points.
- Define regionally notifiable AHFS incidents (e.g. quarantine pest / transboundary disease).
- Designate regional testing and reference laboratories.
- Establish AHFS risk analysis unit under the CAHFSA.

9. INSTITUTIONAL LEGAL AND OPERATIONAL ARRANGEMENTS

Role of CAHFSA

- Chair and coordinate the CAEDRS task force
- Liaise and collaborate with the national and regional AHFS bodies
- Host and manage the regional AHFS inventory including list of regionally notifiable AHFS incidents
- Operate the regional CAEDRS contact point
- Manage and monitor regional responses to regional notifiable AHFS incidents
- Coordinate the activity of regional testing and reference laboratories
- Draft Community decisions and guidance to implement the CAEDRS system
- Support the further development of regional AHFS risk analysis units

Role of RSCBs (including CARIBVet, CARPHA, CPHDF, CARDI, CRFM etc)

- Participate in the CAEDRS and environmental health integration task forces
- Participate in the creation of a regional AHFS inventory
- Support the creation of a web-based data sharing network, the Caribbean AHFS Early Detection and Response System (CAEDRS)

[50] A 12-point checklist for surveillance of diseases of aquatic organisms: a novel approach to assist multidisciplinary teams in developing countries 2021 The checklist is based on a review of available main aquatic surveillance references and scientific literature and was further developed based on the outcomes of several aquaculture biosecurity project-related workshops hosted by the Food and Agriculture Organization of the United Nations. https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12530

- Contribute to the definition of regionally notifiable AHFS incidents (e.g. quarantine pest/transboundary disease)
- Contribute to the designation of regional testing and reference laboratories

Role of national AHFS bodies

- Designate national CAEDRS contact points and responsible personnel
- Designate expert teams to consolidate a national inventory of AHFS threats with a categorisation of threats and delineation of priority threats in fields of plant health, animal health (animal and zoonotic diseases, including TADs), veterinary public health (zoonotic diseases, foodborne infections and intoxications) and environmental health (terrestrial and marine wildlife);
- Draft national legislation and guidance to implement the CAEDRS system

Role of Private Sector representative bodies

- Support the public sector bodies in identification and prioritisation, as well as gathering and communicating data in respect of regional AHFS threats
- Actively participate in the dialogue on solutions to addressing the threats
- Provide resources to support agreed actions

Legislation

- Draft appropriate protocols and guidance to implement CAEDRS system

10. MONITORING AND EVALUATION MECHANISM

Monitoring the implementation of the Action Plan will be undertaken according to the progress against and achievement of key milestones in line with the adopted timelines. (see proposed timeline in Annex 1). Where deadlines are missed, the causes will be identified and corrective action will be agreed and undertaken.

Evaluation will be undertaken at an interim and at a final stage to consider the impact or projected impact and sustainability at the strategic level. The results of this evaluation will be used to guide the definition of the next phase of the policy and action plan.

Milestones

- Caribbean Regional Task Force establishes a Caribbean AHFS Early Detection and Response System (CAEDRS)
- An initial inventory of AHFS threats in the Caribbean region
- A conceptual and functional framework for a Caribbean AHFS Early Detection and Response System (CAEDRS)
- A list of notifiable pests, diseases and illnesses adopted
- Decision taken on the mandatory adoption and implementation of a Caribbean AHFS Early Detection and Response System (CAEDRS)

- AHFS risk analysis unit established under the CAHFSA
- CAEDRS piloted in all CARIFORUM member states
- CAEDRS and AHFS risk analysis units operationalised under the CAHFSA

11. REFERENCES

Amadi, V.A. et al 2015. "Prevalence and antibiotic susceptibility of gram-negative aerobic bacteria cultures form the intestine and hepatopancreas of blue land crab (*Cardisoma guanhumi*) in Grenada, West Indies". British Microbiology Research Journal. 2015/5(2), pp. 169-179.

Bondad-Reantaso, M. et al. 2021. A 12-point checklist for surveillance of diseases of aquatic organisms: a novel approach to assist multidisciplinary teams in developing countries 2021. Reviews in Aquaculture Vol 13 (1). [https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12530]

Brown, V. R. and Bevins, S. N. 2018. A Review of African Swine Fever and the Potential for Introduction into the United States and the Possibility of Subsequent Establishment in Feral Swine and Native Ticks", Front. Vet. Sci., 06 [https://www.frontiersin.org/articles/10.3389/fvets.2018.00011/full]

Butler, J.F. and Gibbs, E.P.J. 1984. Distribution of potential soft tick vectors of African swine fever in the Caribbean region (Acari: Argasidae). Preventive Veterinary Medicine Vol 2, Issues 1–4

Caribbean Public Health Agency. Pathway to 2025: Strategic Plan 2018-2020. 2018. Trinidad and Tobago: CARPHA. [https://www.carpha.org/Portals/0/Documents/CARPHA-Strategic-Plan-2018-2020.pdf]

Chinain, M., Gatti, C.M.I., Darius, H.T., Quod, J.P., Tester, P.A. 2021. Ciguatera poisonings: A global review of occurrences and trends. Harmful Algae. Feb 2021. [https://pubmed.ncbi.nlm.nih.gov/ 33875186/]

Diez, S.M., et al. 2019. Marine Pollution in the Caribbean: Not a Minute to Waste. Washington, D.C. : World Bank Group. [https://documents1.worldbank.org/curated/en/482391554225185720/ pdf/Marine-Pollution-in-the-Caribbean-Not-a-Minute-to-Waste.pdf]

Drake, M. et al. 2013. Prevalence of Salmonella spp. in cane toads (Bufo marinus) from Grenada, West Indies, and their antimicrobial susceptibility", Zoonoses Public Health. 2013/60(6) pp. 437-441.

European Commission. 2020. Ex-post evaluation of the EPA between the EU and its Member States and the CARIFORUM Member States. Revised Interim report. [https://trade.ec.europa.eu/doclib/ docs/2020/february/tradoc_158657.pdf]

European Food Safety Authority. 2010. Scientific opinion on African swine fever. EFSA Journal 8 (3)

European Food Safety Authority. 2014. Evaluation of possible mitigation measures to prevent introduction and spread of African swine fever virus through wild boar. EFSA Journal 12(3)

European Food Safety Authority. 2014. Scientific opinion on African swine fever. EFSA Journal 12(4)

European Food Safety Authority. 2019. Research gap analysis on African swine fever. EFSA Journal 17(8)

Food and Agriculture Organization. 2019. Current Status of agriculture in the Caribbean and implications for Agriculture Policy and Strategy. 2030 - Food, Agriculture and rural development in Latin America and the Caribbean, No14. Santiago de Chile: FAO. 28p

Gwendoline Williams and Associates. 2014. Strategic plan for the Caribbean community 2015 – 2019: Repositioning CARICOM. Vol. 1 - The Executive Plan. Guyana: CARICOM Secretariat. [https://caricom.org/wp-content/uploads/STRATEGIC-PLAN-2016_opt.pdf]

Humphrey, E. 2011. Implementing the Economic Partnership Agreement: Challenges and Bottlenecks in the CARIFORUM region. (ECDPM Discussion Paper 117). Maastricht: ECDPM

Indar, L. 2015. Enhancing early warning and response to travel related foodborne diseases and other public health issues occurring in stay over (hotels) and cruise ship visitors. CARPHA/CHTA/CTO, Communication in CARPHA Regional Foodborne Diseases Surveillance and Food Safety Workshop. Port of Spain: CARPHA

Indar, L. Francis, S. Quesnel, E. Bissessarsingh, O. Olowokure. 2015. Foodborne diseases in the Caribbean, 2005–2014: changing epidemiology and implications for prevention and control. Program and Abstracts Book of the International Conference on Emerging Infectious Diseases. August 24–26. Atlanta, Georgia. Program and Abstracts Book, 109

Landsberg, J. 1995. Tropical reef-fish disease outbreaks and mass mortalities in Florida, USA: what is the role of dietary biological toxins? Diseases of Aquatic Organisms Vol 22: 83-100. [http://www.vliz.be/imisdocs/publications/156539.pdf]

Lefrançois T. et al. 2010. CaribVET: A model for surveillance of zoonotic diseases [2010]. International journal of infectious disease 14 (1)

Lessios, H. A. 1988. Mass Mortality of Diadema Antillarum in the Caribbean: What Have We Learned? Annual Review of Ecology and Systematics Vol. 19 (1988), pp. 371-393

Lyle R. Petersen, James L. Hadler 2013. Surveillance for vector-borne diseases Chapter 9 Pgs 157-173 IN Infectious Disease Surveillance, Second Edition Editor(s): Nkuchia M. M'ikanatha, Ruth Lynfield, Chris A. Van Beneden, Henriette de Valk John Wiley & Sons, Ltd

Maclachlan N.J., Mayo C.E., Daniels P.W. & Gibbs E.P.J. 2015. Bluetongue. In New developments in major vectorborne diseases. Revue scientifique et technique. Vol. 34(2)

Nkogwe, C., et al. 2011. Frequency of Detection of Escherichia coli, Salmonella spp., and Campylobacter spp. in the Faeces of Wild Rats (Rattus spp.) in Trinidad and Tobago. Veterinary Medicine International, April 2011, Apr 12.

PeriagoI, M. R. GalvãoII, L. A., Corvalán, C. Finkelman, J. 2007. Environmental Health In Latin America And The Caribbean: at the crossroads", Saúde Soc. São Paulo Vol 16 (3) p.20–25

Piedra-Castro, L. and Araya-Vargas, A. 2018. Mass mortality of Canthigaster rostrata (Tetraodontiformes: Tetraodontidae) on the southern Costa Rican Caribbean coast. Revista Ciencias Marinas y Costeras, vol. 10, no. 1, 2018 [https://www.redalyc.org/journal/6337/ 633766163002/html/]

Pires, S. et al. 2011. Attributing human foodborne illness to food sources and water in Latin America and the Caribbean using data from outbreak investigations. International Journal of Food Microbiology. International Journal of Food Microbiology. 152(3):129–38

Quincetree Limited. 2021. Report on the Status of AHFS Coordination in the Caribbean; Strengthening Agricultural Health and Food Safety Coordination in the Caribbean. Consultancy Report for 11th EDF SPS Project.

Quincetree Limited. 2021. Strengthening the Agricultural Health and Food Safety Policy Framework in the Caribbean; Situational Analysis. Consultancy Report for 11th EDF SPS Project.

Sylvester, W.R. et al. 2014. Prevalence, serovars and antimicrobial susceptibility of Salmonella spp. from wild and domestic green iguanas (Iguana iguana) in Grenada, West Indies", Zoonoses Public Health. 2014/ 61(6), pp. 436-441.

The World Bank. 2014. Can you imagine a Caribbean minus its beaches? It's not science fiction, it's climate change. [https://www.worldbank.org/en/news/feature/2014/09/05/can-you-imagine-a-caribbean-minus-its-beaches-climate-change-sids]

Williams, E. H., Jr. and L. B. Williams. 1987. Caribbean Marine Mass Mortalities: A problem with a solution. Oceanus 30(4): 69-75. [http://www.globalcoral.org/_oldgcra/85%20Mass%20Mortalities%20Caribbean .pdf]

Willoughby, S. et al. 2002. Factors contributing to the 1999 mass mortality of reef-associated fish in Barbados. IN Proceedings of the 53rd Gulf and Caribbean Fisheries Institute. [https://aquadocs.org/ handle/ 1834/29398]

ANNEXES

ANNEX 1: MEDIUM TERM ACTION PLAN

Stage	Outputs	Timelines	Activities	Responsible	Milestones
Stage 0 (preparatory works)	Assessment and designation of suitable regional institutional arrangements e.g. AHFSS Thematic Group[51] to coordinate AHFS (including VPH and environmental - terrestrial and aquatic - health), Regional Policy implementation activities, and to establish a Caribbean AHFS Early Detection and Response System (CAEDRS).	01.01.2022–01.03. 2022	To assess and designate institutional arrangements to coordinate AHFS (including VPH and environmental - terrestrial and aquatic - health) Regional Policy implementation activities and establish a Caribbean AHFS Early Detection and Response System (CAEDRS).	AHFSS Thematic Group, CAHFSA, AHFS authorities of CARIFORUM member states	Allocation of responsibility for implementation of the policy and for the creation of the Caribbean AHFS Early Detection and Response System (CAEDRS)
Stage 0 (preparatory works)	An initial regional inventory of AHFS threats in the Caribbean region.	01.03.2022–01.08.2022	To task the relevant regional structures[52] to conduct an initial regional inventory of AHFS threats in the Caribbean region with categorisation of threats and delineation of priority threats in fields of:	AHFSS Thematic Group, AHFS authorities of CARIFORUM member states	Tasking the relevant regional structures

[51] Established in October 2014 comprises the Caribbean Agricultural Health and Food Safety Agency (CAHFSA), the CARICOM Secretariat (CCS), the Inter-American Institute for Cooperation on Agriculture (IICA), the Caribbean Regional Fisheries Mechanism (CRFM), CARICOM Chief Veterinary Officers (CCVOs), Caribbean Plant Health Directors Forum (CPHDF), and the Caribbean Public Health Agency (CARPHA)

[52] Acknowledging the existing of many relevant regional including the PRA Working Group, the Committee for Early Warning and Response and the various pest and commodity specific groups;

Stage	Outputs	Timelines	Activities	Responsible	Milestones
			- plant health - animal health (animal and zoonotic diseases, including TADs); - veterinary public health (zoonotic diseases, foodborne infections and intoxications); - environmental health (terrestrial and marine wildlife); To support the conduct of an inventory as above at the national level.		Gathered data for inventory of AHFS threats in the Caribbean region in cooperation with national AHFS stakeholders Initial inventory created
Stage 0 (preparatory works)	Report on priority regional threats to AHFS (including VPH and environmental - terrestrial and aquatic - health) in the Caribbean region	01.08.2022–01.12.2022	Collection and analysis of results of an inventory and preparation of a report containing a consolidated list of regional AHFS threats in descending order of their importance for health, economy, and biodiversity in the Caribbean region (using prioritisation tools where available).	AHFSS Thematic Group CAHFSA, CPHDF, CaribVET, CRFM, and CARPHA	Prepared analysis of results of an inventory. Report containing a consolidated list of AHFS threats prepared

Stage	Outputs	Timelines	Activities	Responsible	Milestones
Stage 1	A conceptual framework for early detection, rapid response and risk-based management of AHFS risks in the Caribbean region	01.01.2023–01.03.2023	To develop and endorse a conceptual framework for early detection, rapid response and risk-based management of AHFS threats in the Caribbean region.	AHFSS Thematic Group CAHFSA	Conceptual framework prepared
Stage 1	Concept for a Caribbean AHFS Early Detection and Response System (CAEDRS)	01.03.2023–01.05.2023	Based on the conceptual framework for early detection, rapid response and risk-based management of AHFS threats in the Caribbean region, to develop and endorse a concept for a Caribbean AHFS Early Detection and Response System (CAEDRS) for: - plant health - animal health (animal and zoonotic diseases, including TADs); - veterinary public health (zoonotic diseases, foodborne infections and intoxications); - environmental health (terrestrial and marine wildlife).	CAHFSA and AHFSS Thematic Group CPHDF, CaribVET, CRFM, and CARPHA	Developed and endorsed Concept for a Caribbean AHFS Early Detection and Response System (CAEDRS)

Stage	Outputs	Timelines	Activities	Responsible	Milestones
Stage 1	A list of notifiable pests, diseases and illnesses (i.e. pests, diseases and illnesses subject to a mandatory notification) of the Caribbean region	01.04.2023–01.05.2023	To develop and endorse a regional AHFS Decision with the list of notifiable pests, diseases and illnesses subject to a mandatory notification in all CARIFORUM member states, including: - pests and diseases in plants; - animal diseases and zoonotic diseases in animals; - pests and diseases in terrestrial and marine wildlife; - zoonotic (food-, water- and vector-borne) diseases in humans; - anthroponotic foodborne diseases and intoxications in humans;	CPHDF, CaribVET, CRFM, CARPHA and Caribbean Regional Task Force for AHFS CAHFSA and AHFS authorities of CARIFORUM member states	Develop and endorsed regional AHFS Decision with the list of notifiable pests, diseases and illnesses
Stage 1	Designated regional reference laboratories for priority [53]pests, diseases and illnesses	01.03.2023–01.04.2023	To designate regional reference laboratories for priority pests and diseases, including: - 3 priority pests and diseases in crops; - 3 priority animal diseases and zoonotic diseases (first of all TADs) in livestock and poultry; - 2 priority pests and diseases in terrestrial and aquatic ecosystems; - 2 priority diseases in terrestrial and marine wildlife; - 9 priority zoonotic infections in humans	Authorised body for designation of laboratories on the advice of CAHFSA, CaribVET, CRFM, and CARPHA	Laboratories designated

[53] Prioritised based on the severity of the economic, social and environmental problems they can cause.

Stage	Outputs	Timelines	Activities	Responsible	Milestones
			• 3 priority zoonotic foodborne infections; • 3 priority zoonotic waterborne infections; • 3 priority vector-borne infections; • 5 priority anthroponotic foodborne diseases and intoxications in humans; Note – Each category (i.e. plant, animal, human) should be handled in different laboratories, but it is not necessary to have different laboratories for diseases within the category.		
Stage 1	Operational and functional design of an electronic web-based system (Caribbean AHFS Early Detection and Response System (CAEDRS) for collection, collation, exchange analysis, mapping and distribution of data on notifiable pests, diseases and illnesses	01.04.2023–01.12.2023	(CAEDRS) to design and develop an electronic web-based system for the collection, collation, exchange analysis, mapping and distribution of data on notifiable pests, diseases and illnesses - based on the conceptual framework for early detection, rapid response and risk-based management of AHFS threats in the Caribbean region and concept paper for Caribbean AHFS Early Detection and Response System.	CAHFSA Caribbean Regional Task Force for AHFS and AHFS authorities of CARIFORUM member states	Designed and developed electronic web-based system for collection, collation, exchange analysis, mapping and distribution of data on notifiable pests, diseases and illnesses

Stage	Outputs	Timelines	Activities	Responsible	Milestones
Stage 1	Tasking or developing suitable regional structures with responsibility for rapid response to AHFS threats.	01.12.2023–01.01.2024	To task or develop suitable regional structures with responsibility for rapid response to AHFS threats, which will include separate teams for: - pests and diseases in plants; - animal diseases and zoonotic diseases in animals; - pests and diseases in terrestrial and marine wildlife; - zoonotic (food-, water- and vector-borne) diseases in humans; - anthroponotic foodborne diseases and intoxications in humans;	CAHFSA, CPHDF, CaribVET, CRFM, and CARPHA Caribbean Regional Task Force for AHFS	Tasked or developed regular suitable regional structures with responsibility for rapid response to AHFS threats
Stage 2	Building capacity in suitable regional structures with responsibility for rapid response to AHFS threats for rapid response to AHFS threats trained	01.01.2024–01.01.2025	To build capacity in suitable regional structures with responsibility for rapid response to AHFS threats		Training and awareness raising undertaken in suitable regional structures with responsibility for rapid response to AHFS threats

Stage	Outputs	Timelines	Activities	Responsible	Milestones
Stage 2	Standardised forms for notification of AHFS threats at national and regional levels	01.12.2023–01.03.2024	To review, revise where necessary and adopt regulation with standardised forms for notification of AHFS threats at national and regional levels, including those for notification of: - pests and diseases in plants; - animal diseases and zoonotic diseases in animals; - pests and diseases in terrestrial and marine wildlife; - zoonotic (food-, water- and vector-borne) diseases in humans; - anthroponotic foodborne diseases and intoxications in humans;	Caribbean Regional Task Force for AHFS and AHFS authorities of CARIFORUM member states CAHFSA	Developed and agreed standardised forms for notification of AHFS threats at national and regional levels
Stage 2	Community Decision on mandatory adoption and implementation of the Caribbean AHFS Early Detection and Response System (CAEDRS)	01.01.2024–01.04.2024	To develop and adopt a Decision on the adoption and implementation of a CAEDRS in all CARIFORUM member states, including: - procedures of reporting notifiable diseases - standardised forms for reporting notifiable diseases - CAEDRS semester and annual report forms	Caribbean Regional Task Force for AHFS CAHFSA CARICOM secretariat	Adopted Decision on adoption and implementation of a CAEDRS in all CARIFORUM member states
Stage 2	Tasking of appropriate regional structures for specific AHFS threats.	01.01.2024–01.03.2024	To task appropriate regional structures with responsibility for specific AHFS threats, including priority threats in fields of: - plant health	CAHFSA, CPHDF, CaribVET, CRFM, and CARPHA Caribbean	Tasked appropriate regional structures with specific AHFS threats

Stage	Outputs	Timelines	Activities	Responsible	Milestones
			- animal health (animal and zoonotic diseases, including TADs); - veterinary public health (zoonotic diseases, foodborne infections and intoxications); - environmental health (terrestrial and marine wildlife);	Regional Task Force for AHFS and AHFS authorities of CARIFORUM member states)	
Stage 2	Pests, diseases and illnesses prioritisation tools	01.04.2024–01.08.2024	To develop prioritisation tools, where not already existing, and facilitate their use for: - plant pests and diseases; - animal diseases and zoonotic diseases (there is a prioritisation tool developed by the CaribVET – to update if needed); - zoonotic (food-, water- and vector-borne) diseases in humans; - anthroponotic foodborne diseases and intoxications in humans;	CPHDF, CaribVET, CRFM, and CARPHA CAHFSA	Prioritisations tools developed or upgraded Prioritisation tools employed region-wide
Stage 2	CAEDRS unit under the CAHFSA established	01.04.2024–01.08.2024	To dedicate and to equip specialised premises in the CAHFSA for operationalising, piloting and administering CAEDRS.	CAHFSA CARIFORUM CARICOM	Premises and necessary infrastructure in place for operationalisation of CAEDRS.
Stage 2	CAEDRS adopted in CARIFORUM member states	01.08.2024–01.01.2025	To develop and adopt an appropriate instrument on the adoption of a CAEDRS at the national level in all CARIFORUM member states, to designate national CAEDRS contact points and to train them in using CAEDRS.	Caribbean Regional Task Force for AHFS CAHFSA	Appropriate instrument on the adoption of a CAEDRS at the national level in all

Stage	Outputs	Timelines	Activities	Responsible	Milestones
					CARIFORUM member state Designated national CAEDRS contact points Trained national CAEDRS contact points
Stage 3	CAEDRS piloted in all CARIFORUM member states	01.01.2025–31.12.2025	To pilot CAEDRS in CARIFORUM member states, including: - collect and collate data on AHFS threats; - analyse data on priority AHFS threats and the report containing: • description of the CAEDRS, including units, chain of command and operations; • gaps and deficiencies identified during 6 months of CAEDRS operation and list of corrective measures to be undertaken; • number of notifications submitted by each CARIFORUM member state; • inventory of AHFS threats in the Caribbean region;	Caribbean Regional Task Force for AHFS and AHFS authorities of CARIFORUM member states CAHFSA	CAEDRS piloted Feedback on pilot usage gathered and analysed Gaps and deficiencies addressed Report submitted to CAHFSA

Stage	Outputs	Timelines	Activities	Responsible	Milestones
			• situation with priority AHFS threats in the Caribbean region, including patterns of their persistence, occurrence and spread and maps of their spotted distribution; Report with findings over the period 01.01.2025–01.07.2025 to be prepared submitted to CAHFSA not late than 01.08.2025		
Stage 3	AHFS risk analysis guidelines developed and approved	01.01.2025–01.07.2025	To develop or update regional guidelines for priority AHFS threat risk analysis, including: - hazard identification - hazard risk assessment - hazard risk analysis - hazard risk communication - AHFS risk analysis reporting forms	Caribbean Regional Task Force for AHFS and ad-hoc regional expert groups for AHFS threats. CAHFSA, CPHDF, CaribVET, CRFM, and CARPHA	Regional guidelines for priority AHFS threat risk analysis upgraded or developed
Stage 3	AHFS risk analysis unit under the CAHFSA established.	01.07.2025–01.09.2025	To establish an AHFS risk analysis unit on the basis of an ad-hoc regional expert groups for AHFS threats. This would include: - development and endorsement of regulation on CAEDRS risk analysis unit, turning ad-hoc regional expert groups on	CAHFSA CARIFORUM CARICOM	Regional AHFS risk analysis unit established

Stage	Outputs	Timelines	Activities	Responsible	Milestones
			AHFS threats into a CAEDRS risk analysis divisions; - dedication and equipment of specialised premises for the operation of CAEDRS risk analysis unit.		
Stage 3	CAEDRS corrective measures applied.	01.08.2025–01.12.2025	To apply corrective measures for eliminating gaps and deficiencies identified within 6 months of piloting CAEDRS and prepare the system for the operation on a regular basis as an official regional mechanism of the CAHFSA for AHFS data collection and analysis.	CAHFSA and Caribbean Regional Task Force for AHFS CARIFORUM CARICOM	Applied corrective measures for eliminating gaps and deficiencies in CAEDRS Operational plan for CAEDRS
Stage 3	CAEDRS and AHFS risk analysis units under the CAHFSA fully operationalised	01.12.2025–01.12.2025	To operationalise CAEDRS and AHFS risk analysis units under the CAHFSA	CAHFSA and Caribbean Regional Task Force for AHFS	Fully operationalised CAEDRS and AHFS risk analysis units under the CAHFSA

ANNEX 2: LINK TO ACCESS THE CARIFORUM REGIONAL AHFS SITUATIONAL ANALYSIS

Please access the Situational Analysis using the following link:

https://drive.google.com/file/d/18GOW4NSRa4IVZovedHnOTXIu5-z2EAqJ/view?usp=sharing

ANNEX 3: LINK TO ACCESS THE SELF-ASSESSMENT TOOL

Please access the Self-Assessment Tool using the following link:

CLICK HERE

ANNEX 4: LINK TO ACCESS THE POLICY CONSULTATION QUESTIONNAIRE

Please access the Policy Consultation Questionnaire using the following links:

Policy Questionnaire - Private Sector

CLICK HERE

Policy Questionnaire - Public Sector

CLICK HERE

10th EDF Sanitary & Phytosanitary Measures Project

Contact
Inter-American Institute for Cooperation on Agriculture (IICA)
IICA Delegation in Barbados
Suite 1B, 2B Building #1
Manor Lodge Complex
Lodge Hill, St Michael,
BB12009, Barbados
Email: sps.project@iica.int
Phone: (246) 271-9210/11/12
Fax: (246) 271-9213